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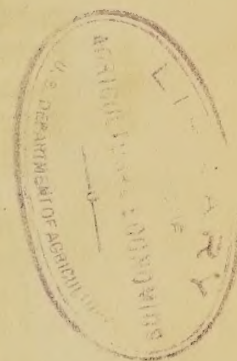
ECONOMIC BRIEF WITH RESPECT TO THE
PROPOSED MILK MARKETING AGREEMENT AND PROPOSED ORDER
FOR THE
DUBUQUE, IOWA, MARKETING AREA

by

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 and O. M. Reed

Appendix B.

Economic Brief with Respect to the
Proposed Marketing Agreement and Proposed Order
for the Dubuque Marketing Area

Part I

The Economic Emergency with Respect to Milk Producers in
the Area which Supplies Milk to the Dubuque Market

The average prices received by farmers for fluid milk testing 3.5 percent butterfat, delivered to dealers on the Dubuque market declined steadily from \$2.28 per hundredweight in 1929 to \$0.98 in 1933-- a decline of 57.0 percent. Since 1933, the price of such milk has risen to an average of \$1.12 in 1934 and \$1.41 in 1935, partly as a result of curtailment of feed supplies due to the drought in 1934, to higher prices for feed, and to improve demand conditions. While prices paid by farmers in the United States for commodities bought also declined from 1929 to 1933, the decline was somewhat less than that of milk prices on the Dubuque market. The index of prices paid by farmers for commodities bought declined from 153 (1910-1914 = 100) in 1929 to 109 in 1933, and then increased to 123 in 1934 and 125 in 1935. (See Table 1.) Thus, there was a marked decline in the purchasing power of fluid milk sold on the Dubuque market from 1929 to 1933, in terms of the commodities bought by farmers. Since then, however, the purchasing power of milk sold on this market has increased. The increase in the purchasing power of milk sold by dairy farmers in this area, however, has probably been less than the increase in purchasing power of milk sold by all farmers in the United States, due to the large increase in price of feeds as a result of the drought in 1934, which was severe in the Dubuque area. In 1935 the average price of 1000 pounds of milk on the Dubuque market was equivalent to the average farm price in Iowa of 15.6 bushels of corn, 0.8 tons of alfalfa hay, or 64.8 pounds of cottonseed meal. In 1929 it was equivalent to 29.3 bushels of corn, 1.3 tons of hay, or 102.9 pounds of cottonseed meal.

The gross income of farmers selling milk on the Dubuque market, also seems to have declined about the same as the average price of the milk sold. In the three States, Iowa, Illinois and Wisconsin, where the milk and cream supply for this market is produced, the gross income

from milk declined 49.8, 41.3 and 52.2 percent respectively from 1929 to 1933.^{1/} (See Table 2.) There was a similar decline in the United States as a whole and there is no reason to expect that the decline in the area from which Dubuque obtains its milk supply has been materially different. In 1934 the gross income from milk in these States increased about the same as the increase in price of milk sold on the Dubuque market. Changes in the cash income of farmers in the three States from which Dubuque draws its supply of milk have also been about the same as the gross income from 1929 to 1935, as shown in Table 2.

The foregoing facts and consideration demonstrate conclusively that in the Dubuque milk shed and the States of Iowa, Illinois and Wisconsin, there was a marked decline during the period 1929-1933 in (1) the prices received by producers for milk sold wholesale, (2) the purchasing power of such milk, (3) the gross income from milk produced on farms, and (4) the cash income from dairy products sold from farms. According to available data for the years 1934 and 1935 there was only a partial recovery in such prices, purchasing power and income.

^{1/} For details with respect to the share of the total supply of milk for Dubuque from each of the States, see Part III.

Table 1. Average prices received by producers per hundredweight of 3.5 percent milk delivered at handler's plant in Dubuque, Iowa; percent which prices are of 1929 price; United States index of prices paid by farmers for commodities bought, and percent of 1929, by years 1929 to 1933, by months 1934 and 1935.

	Average price per hundredweight of 3.5 percent milk delivered at handler's plant	Percent of 1929	United States index of prices paid by farmers for commodities bought (1910-1914 = 100)	Percent of 1929
	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
1929	2.28		153	-
1930	1.87	82.0	145	94.8
1931	1.38	52.6	124	81.0
1932	.99	43.4	107	69.9
1933	.98	43.0	109	71.2
1934	1.12	49.1	123	80.4
January	1.08	47.4	117	76.5
February	1.11	48.7	119	77.8
March	1.10	48.2	120	78.4
April	1.09	47.8	120	78.4
May	1.07	46.9	121	79.1
June	1.08	47.4	121	79.1
July	1.06	46.5	122	79.7
August	1.12	49.1	125	81.7
September	1.11	48.7	126	82.4
October	1.12	49.1	126	82.4
November	1.15	50.4	126	82.4
December	1.32	57.9	126	82.4
1935	1.41	61.8	125	81.7
January	1.51	66.2	126	82.4
February	1.54	67.5	127	83.0
March	1.46	64.0	127	83.0
April	1.48	64.9	127	83.0
May	1.27	55.7	127	83.0
June	1.17	51.3	127	83.0
July	1.18	51.8	126	82.4
August	1.22	53.5	125	81.7
September	1.29	56.6	123	80.4
October	1.40	61.4	123	80.4
November	1.60	70.2	122	79.7
December	1.76	77.2	122	79.7

Table 2. Farm income from dairy products for the States of Iowa, Illinois and Wisconsin, during the period 1929 to 1934, inclusive.

Year and State	Gross Income		Cash Income	
	Gross income from milk produced on farms	Percentage decrease from 1929	Cash income from dairy products sold from farms	Percentage decrease from 1929
	<u>1,000 dollars</u>	<u>Percent</u>	<u>1,000 dollars</u>	<u>Percent</u>
Iowa				
1929	105,320	-	90,241	-
1930	87,476	16.9	75,170	16.7
1931	65,903	37.4	56,472	37.4
1932	50,542	52.0	43,106	52.2
1933	52,905	49.8	45,012	50.1
1934	60,506	42.6	51,832	42.6
1935				
Illinois				
1929	104,376	-	86,977	-
1930	95,718	8.3	80,332	7.6
1931	76,760	26.5	64,102	26.3
1932	63,308	39.3	52,532	39.6
1933	61,235	41.3	50,492	41.9
1934	69,962	33.0	58,263	33.0
1935				
Wisconsin				
1929	228,552	-	217,940	-
1930	181,877	20.4	173,439	20.4
1931	133,370	41.6	126,408	42.0
1932	99,157	56.6	93,573	57.1
1933	109,200	52.2	102,834	52.8
1934	113,586	50.3	107,586	50.6
1935				
United States:				
1929	2,322,553	-	1,847,235	-
1930	2,030,853	12.6	1,615,363	12.6
1931	1,614,394	30.5	1,278,531	30.8
1932	1,260,424	45.7	985,099	46.7
1933	1,262,554	45.6	988,880	46.5
1934	1,421,253	38.8	1,114,016	39.7

Compiled from reports of the Bureau of Agricultural Economics.

Part II

The Importance of Dairy Farming as an Agricultural Enterprise in the Area Supplying Milk to Dubuque.

The importance of milk production as an agricultural enterprise in the three States from which Dubuque draws its supply of milk and cream is indicated in Table 3. Since 1929, farmers in Iowa have been receiving nearly 15 percent of their cash farm income from the sale of dairy products; farmers in Illinois have been receiving around 20 percent, and farmers in Wisconsin more than 50 percent. For the United States as a whole, the income of farmers from the sale of dairy products has constituted about 20 percent of their total farm income.

In the Dubuque milk shed farmers probably obtain a larger percentage of their income from the sale of dairy products than for the State of Iowa as a whole, but probably not as large a percentage as for the State of Wisconsin as a whole.

Such being the case, activity directed toward the enhancement of milk prices to producers and financial returns from milk production in the area supplying milk to the Dubuque Marketing Area is warranted and necessary to effectuate the policy of Congress, as stated in the Agricultural Adjustment Act.

Table 3. Cash income from all farm products and percentage cash income from dairy products was of cash income from all farm products in the United States and in Iowa, Illinois and Wisconsin, supplying milk to the Dubuque, Iowa, Marketing Area, 1929 - 1934.

Year	United States			Iowa		Illinois		Wisconsin	
	Cash income from all farm products	Percent which cash income from dairy production is of total cash income from farm production	Percent	Cash income from all farm products	Percent which cash income from dairy production is of total cash income from farm production	Cash income from all farm products	Percent of total cash income from farm production	Cash income from all farm products	Percent which cash income from dairy production is of total cash income from farm production
	1,000 dollars		Percent	1,000 dollars	Percent	1,000 dollars	Percent	1,000 dollars	Percent
1929	10,284,479	18.0		685,701	13.2	510,235	17.0	395,947	55.0
1930	7,987,606	20.2		572,485	13.1	428,701	18.7	319,848	54.2
1931	5,795,148	22.1		391,677	14.4	305,221	21.0	226,545	55.8
1932	4,368,296	22.6		276,948	15.6	235,535	22.3	159,570	58.6
1933 ^{1/}	5,402,094	18.3		309,391	14.5	258,789	19.5	174,642	58.9
1934 ^{1/}	6,261,123	17.8		394,631	13.1	314,826	18.5	210,418	51.1

Compiled from reports of the Bureau of Agricultural Economics, Division of Crop and Livestock Estimates.

^{1/} Includes benefit payments and Government purchases.

Part III

The Character of the Commerce in Milk in the Dubuque Marketing Area.

Section 8 c (I) of the Agricultural Adjustment Act, as amended, provides that: "The Secretary of Agriculture shall, subject to the provisions of this section, issue and from time to time amend, orders applicable to processors, associations of producers, and others engaged in the handling of any agricultural commodity or product thereof specified in subsection (2) of this section. Such persons are referred to in this title as "handlers". Such orders shall regulate, in the manner hereinafter in this section provided, only such handling of such agricultural commodity, or product thereof, as is in the current of interstate or foreign commerce, or which directly burdens, obstructs, or affects, interstate or foreign commerce in such commodity or product thereof."

Section 8c (5) of the Agricultural Adjustment Act, as amended, states that: "In the case of milk and its products, orders issued pursuant to this section shall contain one or more of the following terms and condition, and (except as provided in subsection (7) no others:

"(A) Classifying milk in accordance with the form in which, or the purpose for which it is used, and fixing, or providing a method for fixing minimum prices for each such use classification which all handlers shall pay, and the time when payments shall be made, for milk purchased from producers or associations of producers. Such prices shall be uniform as to all handlers, subject only to adjustments for (1) volume, market, and production differentials customarily applied by the handlers subject to such orders, (2) the grade or quality of the milk purchased, and (3) the locations of which delivery of such milk, or any use classification thereof is made to such handlers",

The city of Dubuque is located on the northeastern border of Iowa, close to the states Illinois and Wisconsin. A considerable quantity of milk produced in the latter two states is sold in the Dubuque Marketing Area. The market administrator reported that during the period December 5, 1934 to June 30, 1935, a total of 8,623,115 pounds of milk was sold in this market as Class I, II or III, of which 883,916 pounds or 10.25 percent was produced in Illinois, and 504,815 pounds or 5.85 percent was produced in Wisconsin. The proportion varies slightly from month to month as shown in Table 5.

The market administrator also reports that during this period only one of the seven handlers (not including producer-distributors) selling milk in this market obtains all of his milk from the State of Iowa, and the total purchases of this handler constituted only 3.4 percent of the amount of milk purchased by all handlers in this market during this period. (See Table 6.).

Another handler selling milk in the Dubuque market purchased all of his supply in Wisconsin. Purchases of this handler amounted to 2.8 percent of the total supply in the Dubuque market. The remaining five handlers purchased their milk from producers in Iowa and Illinois or Wisconsin or both. All of the milk purchased by these five handlers is delivered to their respective plants, and there handled irrespective of the state of origin. Milk received from Illinois or Wisconsin is indistinguishable from that produced in Iowa. It is all mixed together in the handlers' plant.

Table 5. Total monthly purchases (including production of producer handlers) of all Handlers by States showing percentage from each State by months for period December 5, 1934 to June 30, 1935.

Month	Iowa			Illinois			Wisconsin			Total Milk in Market	Percent of Total
	Volume	Percent of total milk in Iowa	Percent of total milk in the market	Volume	Percent of total milk in the market	Percent of total milk in the market	Volume	Percent of total milk in the market	Percent of total milk in the market		
	Pounds	Percent	Percent	Pounds	Percent	Percent	Pounds	Percent	Percent	Pounds	Percent
1934											
December	789,074	10.91	84.91	92,482	10.46	9.95	47,770	9.46	5.14	929,326	10.78
1935											
January	969,395	13.40	86.19	101,534	11.49	9.03	53,760	10.65	4.78	1,124,689	13.04
February	910,539	12.59	85.47	103,449	11.71	9.71	51,345	10.17	4.82	1,065,333	12.35
March	986,408	13.63	82.78	118,274	13.38	9.93	86,848	17.21	7.29	1,191,530	13.82
April	973,231	13.45	83.32	123,942	14.02	10.61	70,861	14.04	6.07	1,168,034	13.53
May	1,259,160	17.41	82.73	169,021	19.12	11.11	93,767	18.57	6.16	1,521,948	17.65
June	1,346,577	18.61	83.01	175,214	19.82	10.50	100,464	19.90	6.19	1,622,255	18.81
Totals	7,234,384	100.00	83.90	883,916	100.00	10.25	504,815	100.00	5.85	8,623,115	100.00

Compiled from annual report of the Market Administrator.

Table 6. Total purchases from producers, by States, December 1934 - June, 1935, by handlers in the DUBUQUE Marketing Area, according to place of business and source of supply from producers.

Type of handler	Iowa			Illinois			Wisconsin			Total		
	Volume	Percent of		Volume	Percent of		Volume	Percent of		Volume	Percent of	No. of hand- lers
		All milk purchased in Iowa	All milk purchased		All milk purchased in Illinois	All milk purchased		All milk purchased in Wisconsin	All milk purchased			
	<u>Pounds</u>			<u>Pounds</u>			<u>Pounds</u>			<u>Pounds</u>		
Type I	271,213	4.2	3.4				271,213			271,213	3.4	1
Type II							224,547	44.5	2.8	224,547	2.8	1
Type III	3,673,313	56.4	46.5	77,493	8.8	1.0				5,750,806	47.5	2
Type IV	723,062	11.1	9.2				4,656	.9	.06	727,718	9.3	1
Type V	1,841,485	28.3	23.3	806,423	91.2	10.2	275,612	54.6	3.5	2,923,520	37.0	2
Totals	6,509,073	100.0	82.4	883,916	100.0	11.2	504,815	100.0	6.4	7,897,804	100.0	7

Type I -	Handlers located in Iowa	purchasing milk from producers located in Iowa only.
" II -	" "	" " " in Wisconsin only.
" III -	" "	" " " Iowa and Illinois.
" IV -	" "	" " " Iowa and Wisconsin.
" V -	" "	" " " Iowa, Illinois & Wisconsin.

It is, therefore, apparent that the prices received for milk sold in the Dubuque Marketing Area by a considerable number of farmers living outside of the State of Iowa, would be directly affected by price policies adopted in the Dubuque market. For instance, price cutting in this market would tend to reduce the prices received by producers in Illinois and Wisconsin as well as by producers in Iowa. On the other hand, if an attempt were made by means of a marketing agreement to raise the price paid by handlers in this market for milk produced in Iowa above the price that would otherwise prevail, the price paid by these handlers for milk produced in other states would also be affected. Furthermore such an agreement would probably tend to cause handlers in this market to decrease their purchases of milk in Iowa and to increase their purchases in Illinois and Wisconsin. On the other hand if the agreement only raised the price of milk coming into this market from outside of the State, handlers would tend to buy a larger proportion of their milk supply within the State of Iowa to the detriment of producers in Illinois and Wisconsin. As pointed out above, nearly all of the handlers in this market buy a part or all of their milk from outside the State of Iowa. It would be relatively easy, therefore, for them to expand their purchases of milk in Iowa, Illinois or Wisconsin. In other words, any agreement that attempts to regulate the marketing and price of milk in the Dubuque Marketing Area would directly affect the price received for milk by producers in all three States. The price of one portion of the supply cannot be regulated without directly affecting the remaining portions.

The foregoing facts and considerations demonstrate conclusively that nearly all of the milk handled in the Dubuque, Iowa, Marketing Area actually moves across State lines or is directly mixed with milk which has moved across State lines and that, in order to regulate the handling of such milk so as to effectuate the policy of Congress as stated in the Agricultural Adjustment Act, the handling of all other milk which is handled in the marketing area must also be regulated in the same manner.

Part IV

The Price Structure Provided by the Proposed Agreement and Order.

A general discussion of the price structure for milk is set forth in Technical Paper No. 1 published by the Dairy Section of the Agricultural Adjustment Administration. E. W. Gaumnitz and O. M. Reed, The Price Structure for Milk, Technical Paper No. 1., Dairy Section, Agricultural Adjustment Administration, U. S. Dept. of Agriculture. (Appendix A)

In this paper it is shown that the classified price plan of selling milk to distributors develops from the competition among distributors to secure an even supply of milk, or rather, a supply of milk that is closely related to such distributors' requirements for milk for their fluid milk trade. This paper also shows how differences in (1) costs of transporting a unit of milk in fluid form and the product equivalent of a unit of fluid milk, and (2) varying sanitation regulations applicable to milk produced for fluid use and milk produced for use in manufactured dairy products, affect the differential between the price of milk used for different purposes.

I. Use Classification.

Classification of milk according to use for the purpose of pricing is a well-established practice in the important fluid milk markets of the United States. The reasons for classifying milk according to use are set forth in the Technical Paper No. 1 referred to above. In the Dubuque market milk has been sold according to a classified use plan with applicable prices for each classification for a number of years.

During 1932 milk was being sold to handlers in Dubuque by the Dubuque Cooperative Dairy Marketing Association according to the following classification:

- Class I All milk and cream, bottled and bulk.
- Class II ... All milk used in the manufacture of ice cream.
- Class III .. All milk used in excess of Class I and Class II.

This classification was continued until June 1, 1932, at which time Class I milk was divided into two classes, one consisting of all milk sold as fluid milk and the other, all milk used in the manufacture of cream to be sold for consumption as cream, and Classes II and III were renumbered III and IV. This revised classification was continued until December 5, 1934 when the Federal License No. 94 became effective for the Dubuque Marketing Area providing for the following classification of milk:

1. All milk sold or distributed by distributors as whole milk for consumption or use in the Sales Area.
2. All milk used by distributors to produce cream for sale or distribution by distributors for consumption or use in the Sales Area.
3. All milk purchased, sold or distributed by distributors in excess of Class I and Class II milk.

The classification of milk provided in the proposed marketing agreement and order is as follows:

Class I milk -- All milk sold or distributed as milk.

Class II milk -- All milk used to produce cream for consumption as cream.

Class III milk -- All milk which is specifically accounted for (a) as sold, distributed or disposed of other than as milk, or cream, for consumption as cream, and (b) as specific loss in manufacturing, and (c) as general plant shrinkage within reasonable limits.

Milk used in the manufacture of chocolate milk, flavored milk drinks, creamed cottage cheese, and creamed buttermilk is considered as class III milk.

This classification of milk provided in the proposed marketing agreement and order is similar to that provided in License No. 94 for Dubuque, Iowa.

A separate class for milk used to produce cream for consumption as cream is considered necessary in this market, under the proposed marketing agreement and order, because of the possibility of producers sending cream to this market for consumption as cream. Two producers are known to be sending such cream into this market. There is nothing in the proposed marketing agreement and order to prevent handlers from buying the cream they need for sale to consumers as cream, from producers as cream. In order, therefore, to place handlers' buying milk for use in the production of cream for consumption as cream, on a more nearly comparable competitive basis with handlers' buying cream for consumption as cream, a separate classification with a price level below that of class I is needed. It may also be noted that in the Quad Cities and Des Moines markets, a separate classification is also provided for milk used to produce cream for consumption as cream.

Since License No. 94 became effective on December 5, 1934, the proportion of class I milk to the total estimated amount of milk sold in this market each month has varied from a low point of 31.6 percent in June 1935 to a high of 64.5 percent in December 1935. During the summer months the proportion of class III milk increased a great deal and that of other milk declined. (See Table 13.)

2. Minimum prices to producers provided by the proposed marketing agreement and order.

Each handler is required under the proposed marketing agreement and order for Dubuque, Iowa to pay producers, delivering milk to such handlers' plant during each delivery period, a minimum price per

hundredweight of milk containing 3.5 percent butterfat, sometimes called a blended average price, calculated on the basis of the following minimum prices per hundredweight of each class of milk used by each handler.

Class I milk ----- \$2.00

Class II milk ----- 1.42

Class III milk ----- 3.5 times the average price per pound of 92 score butter at wholesale in the Chicago market, as reported by the United States Department of Agriculture for the delivery period during which such milk is purchased, plus 15 cents.

The minimum (or uniform) price to be paid by each handler, who is not a producer, purchasing milk from producers during each delivery period, per hundredweight of milk containing 3.5 percent butterfat, is calculated by first multiplying the quantity of milk sold in each class (regardless of butterfat content) by each handler, which was not purchased from other handlers', by the price established for each class of milk. The resulting value is then divided by the total quantity of milk for which such value is computed to obtain the minimum or uniform price for milk containing 3.5 percent butterfat. (See Article VII of the Proposed Marketing Agreement and Order).

In calculating the minimum prices to be paid for milk purchased from producers by handlers who are also producers, the milk in each class purchased by such handlers from other handlers is first deducted, and the milk purchased from producers is apportioned to each class according to the ratio which such handlers' remaining total sales in each class bears to his remaining total sales in all classes. This procedure is specified in Article VI.

Individual producers, however, may receive more or less than this minimum price per hundredweight of milk, if the butterfat content of milk delivered is above or below 3.5 percent. Section 3 of Article VIII specifies that if any producer has delivered to any handler during any delivery period milk having an average butterfat content other than 3.5 percent, such producer shall be paid the calculated uniform price for such handler plus or minus one-tenth of the average price of 92 score butter at wholesale in the Chicago market but not less than 3 cents or more than 4 cents for each one-tenth of one percent that the butterfat content is above or below respectively 3.5 percent.

A. Price history of the Dubuque market:

On December 5, 1934 License No. 94 became effective for the Dubuque market providing for a class I price of \$1.60 per hundredweight and certain specified formulae for calculating the prices of classes II and III. At this time the class I price in the Quad Cities market was \$1.70 per hundredweight and \$2.00 in the Des Moines market. On February 26, 1935 the license for the Quad Cities market was amended so as to provide for a minimum class I price of \$1.90. This price is still in effect. So is the \$2.00 class I price for Des Moines. In both markets the formula for determining class II prices are the same as those specified in license No. 94 for Dubuque.

In February, 1935 when the class I price in Quad cities was raised to \$1.90, there was a considerable demand from farmers around Dubuque for an increase in the class I price to \$2.00 on the Dubuque market, but no change was made. The market administrator on March 15, 1935, however, reported that he "expects this problem (of an increase in the class I price) to arise again in the near future, due to the fact that Dubuque is receiving for Class I milk, a lower price than any city of its size within a radius of two hundred miles of Dubuque. For example, the License price in Des Moines is \$2.00 per cwt., Class I. Des Moines is two hundred miles from Dubuque. Mason City has an agreed price of \$2.00 per cwt., Class I. Mason City is only about one hundred fifty miles from Dubuque. Cedar Rapids has \$1.85 for Class I milk, and is only seventy miles from Dubuque. Davenport's Class I milk price is \$1.90 per cwt., and is within seventy miles of Dubuque.

"It should be remembered that feed conditions surrounding Dubuque are much better than some of the towns referred to above. Another consideration is that Dubuque has quite a number of cheese factories and whole milk creameries very close at hand."

In November, 1935, however, the dealers in Dubuque agreed to pay a premium for Class I milk of 30 cents per hundredweight above the price specified in the license, or \$1.90 per hundredweight. The proposed marketing agreement and order for Dubuque now provided for a Class I price of \$2.00 and a Class II price of \$1.42 without any change in the formula for determining prices of Class III milk.

A comparison of the blended average prices paid producers in the Dubuque and Quad Cities markets from December 1934 to March 1936, inclusive, is shown in Table 7. From December 1934 to February 1935 inclusive the blended prices in these two markets were approximately the same. From March to October 1935, however, the blended price received by producers selling milk on the Quad Cities market was about 20 cents per hundredweight above that received by producers selling on the Dubuque market. Since the Class I milk price in Dubuque was raised to \$1.90 in November 1935, the blended price of milk in Dubuque has been slightly above the price in Quad Cities.

Table 7. Comparison of blended average prices paid to producers by handlers in Quad Cities and Dubuque, December 1934 to February 1936, inclusive.

Year and Month	Blended average price paid per hundredweight of milk		Quad Cities price minus Dubuque price Dollars
	Quad Cities	Dubuque	
	Dollars	Dollars	
1934			
December	1.51	1.49	.02
1935			
January	1.55	1.52	.03
February	1.60	1.55	.05
March	1.62	1.48	.14
April	1.64	1.49	.15
May	1.43	1.28	.15
June	1.35	1.19	.16
July	1.42	1.21	.21
August	1.47	1.25	.22
September	1.54	1.30	.24
October	1.63	1.41	.22
November	1.71	1.62	.09
December	1.71	1.75	-.04
1936			
January	1.71	1.76	-.05
February	1.76	1.79	-.03

Compiled from reports of the Market Administrators.

During the period that license No. 94 has been in effect in this market the differential between prices of class I and Class II milk has varied widely. For a time in the early part of 1935 class II prices were above the class I price. During the summer of 1935, however, class II prices dropped to around 40 cents per hundredweight below class I price. There was a maximum spread for the delivery period June 16-30 of 43 cents per hundredweight. Class III prices have also varied in their relation to class I prices, but have always been considerably lower. They were also consistently lower than the prices paid by cheese factories in or near Dubuque from August to December 15 inclusive, as shown by Table 8.

It should also be noted that the blended average price of \$1.41 per hundredweight paid to farmers for milk delivered to handlers in Dubuque during 1935 was slightly higher than that paid by the condenseries in this area. The average price paid at four condenseries in this area in 1935 was \$1.36 per hundredweight of milk.

During December 1934 and January 1935 the retail price of milk in both markets was approximately the same. From February 1, 1935 (prior to the increase in class I prices) until November 1935, the retail price in the Quad Cities has been about a cent higher than in Dubuque. In November 1935 the retail price in Dubuque was raised about a cent, but soon dropped back to its former level, until February 1936 when it was again raised to about the same level as in the Quad Cities.

B. Demand conditions in Dubuque, Iowa:

1. Business conditions - purchasing power of consumers.

There has been considerable improvement in business conditions in the Dubuque marketing area in recent months. According to information received from the editor of The Dubuque Leader, which is the official Newspaper of Dubuque Organized Labor, the wood working mills, which are the biggest source of employment in Dubuque, have increased their pay rolls fifteen per cent over the average of 1935. The McDonald Company, a large manufacturer of pumps and automatic water systems, are also employing additional men. The Maxon Construction Company, which has the contract for building the government dam across the Mississippi River at this point, have put on 425 men to rush the work through the Summer and Fall. They have only been working a skeleton crew since the first of the year because of extreme cold weather in January and because of recent high water. Since the first of the year the Maizewood factory which has been shut down since 1928 has started operations again.

Since the first of the year there has also been a marked increase in retail sales of commodities in the city of Dubuque. Two of the largest department stores report a very satisfactory increase, especially in house

furnishings, electric refrigerators, rugs, and other high priced articles. Automobile sales are showing more than the usual seasonal increase, especially in the smaller cars. Local farm machinery companies report very good business this Spring. Tractor sales are much higher than those in 1935.

Furthermore, during the last four months several new business establishments have opened in Dubuque in down town locations which have been vacant for the last few years, and there has been a tendency on the part of merchants to improve and modernize their business establishments.

The Northeastern Bell Telephone Company reports that 162 more phones were installed than removed during the first four months of 1936 compared with only 37 during the same period of 1935.

Real Estate agents report a decided increase in rents of apartments and houses. There are very few dwellings or apartments vacant in the city.

From all indications Dubuque is showing a decided improvement in business conditions for 1936 as compared with the summer of 1935.

The number of families on relief in Dubuque, Iowa has also declined about 50 percent, as shown by Table 9. In April 1936, 1,193 families were reported as being on relief compared with 2,352 families in April 1935.

2. The trend of milk consumption in the Dubuque Sales Area.

According to the market administrators reports, the consumption of Class I milk in Dubuque during January and February 1936, was about 10 per cent less than in the same months of 1935. No adequate explanation of the cause of this decline is available.

3. Seasonal variation in sales of fluid milk in Dubuque, Iowa.

There is no apparent seasonal variation in the sales of fluid milk in the Dubuque market. See Table 13. Average daily sales of Class I milk per month reported by the market administrator, however, declined steadily throughout 1935. As noted above, no adequate explanation of the cause of this decline is available.

Table 8. Comparison of prices paid in Dubuque for Class III milk with prices paid by cheese factories in the Dubuque Supply Area for 3.5 per cent milk per hundredweight, August 1, 1935 to December 15, 1935.

Delivery Period	Prices paid for Class III milk under License No.94	Prices paid by cheese factories in this area for 3.5 percent milk	Premium paid by cheese factories over Class III price
	<u>Dollars per Cwt.</u>	<u>Dollars per Cwt.</u>	<u>Dollars per Cwt.</u>
1935			
August 1-15	.99	1.05	.06
16-31	1.02	1.12	.10
Sept. 1-15	1.05	1.12	.07
16-30	1.03	1.12	.09
Oct. 1-15	1.07	1.12	.05
16-31	1.12	1.225	.105
Nov. 1-15	1.21	1.26	.05
16-30	1.29	1.365	.075
Dec. 1-15	1.31	1.435	.125

Table 9. Number of families receiving relief in
Dubuque, Iowa.

Month	Families		
	Total	Unemployed	Unemployables
<u>1934</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
December	2021	1972	49
<u>1935</u>			
January	2325	2264	61
February	2355	2302	53
March	2444	2368	76
April	2352	2272	80
May	2291	2108	183
June	2130	1912	218
July	2118		
August	1923		
September	2072		
October	1967		
November	1899		
December	1724		
<u>1936</u>			
January	1418		
February	1197		
March	1139		
April	1193		

Data from relief headquarters in Dubuque, Iowa.

Compiled from annual report of the Market Administrator.

C. Supply conditions

(1) Location and boundaries of the Dubuque Milk Supply Area.

Figure 1 shows the area in which most of the producers who send their milk to the Dubuque market are located. Nearly all of the fluid milk sold in this market is produced within ten miles of the city. About 85 percent of the producers selling on this market are located in Iowa, ten percent in Illinois and five percent in Wisconsin.

About 70 percent of Dubuque's fluid milk receipts by distributors are brought in by the producers themselves. The remaining 30 percent, with the exception of one load, is hauled by independent truckers. One truck is operated by a milk distributor. Practically all of this milk is hauled for a uniform charge of 15 cents per hundredweight.

(2) Type of farming

The area in which milk is produced for the Dubuque market is very hilly. Much of the land erodes badly when in cultivated crops and is best suited to the production of grass and hay. In Dubuque county 56.9 percent of all land in farms in 1929 was in pasture and hay according to the United States Census reports. In Jo Daviess County, Illinois, from which Dubuque draws about ten percent of its milk supply 63.9 percent of the land in farms was devoted to grass and hay in 1929 according to the Census reports. (See Table 10)

Dairying is the most important single farm enterprise in the Dubuque milk shed. In 1929 17.3 percent of the farms in Dubuque County, where about 80 percent of the milk consumed in the Dubuque market area is produced, received 40 percent or more of their farm income from the sale of dairy products (hereafter called dairy-type farms) according to the United States Census. In Jo Daviess County, Illinois, and Grant County, Wisconsin, from which Dubuque receives a considerable quantity of milk, the percentage of dairy-type farms was 28.5 and 42.4 respectively. (See Table 11). The average number of milk cows on these dairy-type farms in each county ranged from 13.9 to 14.7 per farm. Most of these cows were of dairy breeds. The average number of milk cows on all farms in each of these counties, however, was nearly as large as for the dairy-type farms, ranging from 11.0 milk cows per farm in Dubuque County, Iowa, to 11.7 in Grant County, Wisconsin. (See Table 11).

FIGURE 1:- DUBUQUE, IOWA, MILK SUPPLY AND SALES AREA

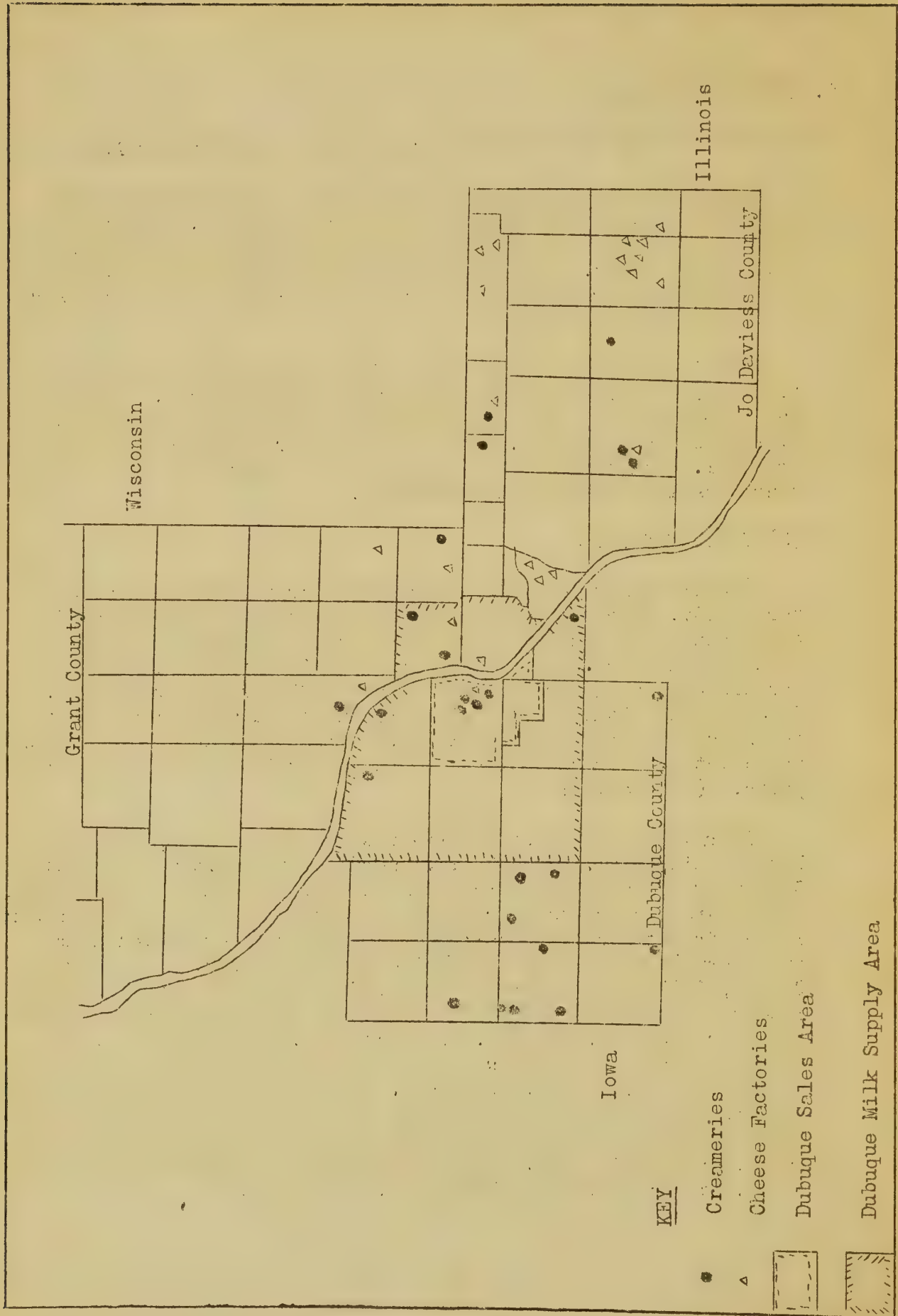


Table 10. Use of land in selected areas adjacent to and including the Dubuque milk supply area, 1929.

County or State	Percent land in farms is of total land	Percent of land in farms in specified crops				
		All pasture	All crops	Corn	Threshed oats	Hay
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Dubuque, Ia.	94.1	38.8	56.2	19.6	13.9	18.1
Jo Daviess, Ill.	87.4	48.1	45.0	15.0	8.6	15.8
Grant, Wis.	90.6	46.1	46.8	14.0	8.9	15.4
Iowa	95.6	28.0	66.8	32.5	17.2	10.5
Illinois	85.6	24.8	68.9	27.9	12.6	9.5
Wisconsin	61.9	40.3	46.7	8.9	9.8	16.9

Compiled from U. S. Census of Agriculture, 1930, Volume II,
County tables, I & V.

Table 11. Type and size of farm, size of herd, type of cattle enterprise and annual expenditure for feed per farm in selected areas which include the Dubuque Milk Supply Area.

County and State	Percent of farms of Dairy type ¹ / ₂	Size of farm Acres	Size of dairy type farms Acres	No. of milk cows		Percent milk cows are of all cattle	Percent milk cows of dual purpose and beef breeding are of all milk cows		Annual expenditure for feed per farm	
				Per farm report-	Per dairy type farm		On all farms	On dairy type farms	All farms	Dairy farms
				ing milk cows Number	type farm Number		Percent	Percent	Dollars	Dollars
Iowa Dubuque Co.	17.3	159	145	11.0	13.9	40.5	24.9	10.3	253	250
Illinois Jo Daviess Co	28.5	172	171	11.3	14.7	39.1	24.6	9.0	207	229
Wisconsin Grant Co.	42.4	166	169	11.7	14.5	41.8	17.9	5.9	248	246
Iowa	5.9	158	137	6.5	11.9	31.4	35.0	14.7	369	309
Illinois	10.4	143	137	5.1	11.9	41.2	16.9	6.0	251	313
Wisconsin	68.9	120	125	11.1	12.7	52.9	4.3	2.8	225	233

Compiled from the United States Census of Agriculture for 1930. (Volume II, Part 1, and Volume III, Part 1.)

¹/₂ With over 40 percent of the total value of farm products sold, exchanged or used by the farmers family received from income from dairy products and from milk cows and calves.

Dairying is consequently an important enterprise on most farms in this area.

Purchases of feed by farmers in this area, however, are small. Most of the feed used is home grown, and enterprises other than dairy compete to some extent for the use of it. Poultry is fairly important, but the number of hogs produced is relatively small. Both enterprises supplement the dairy enterprise to a considerable extent. There are no important alternative markets for feed produced on farms in the Dubuque milk shed. In general, milk production in this area is linked quite closely to the production of feed crops.

(3) Disposition of milk produced.

No data are available showing the amount of milk produced in the Dubuque milk supply area in 1935, or the disposition of it. The production and disposition of milk in 1929 in the three counties from which Dubuque draws its milk supply was reported by the United States Bureau of Census to be as shown in Table 12. The total amount of milk produced in Dubuque County in 1929 was greatly in excess of the amount of milk received in Dubuque sales area in 1935, as reported by the market administrator. Nearly three-fourths of the milk produced in 1935 in Dubuque county, however, was separated on the farm and only the cream sold. Only 15.4 million pounds of whole milk was reported as sold from farms in this county in 1929. This included milk sold to cheese factories and to other manufacturing plants as well as sales to handlers in Dubuque and local towns in the county. In 1935 the market administrator also reported that 15.4 million pounds of milk was received in Dubuque.

In Jo Daviess County, Illinois, the production of milk in 1929 was about the same as in Dubuque County, but the amount sold as whole milk was much larger, being 42.9 percent.

In Grant County, Wisconsin, the production of milk in 1929 was greater than in Dubuque and Jo Daviess counties combined, and 39.9 percent of it was sold as whole milk, to handlers in Dubuque and local towns, and to cheese factories and other manufacturing plants.

It is, therefore, apparent that the volume of milk consumed in the Dubuque marketing area is only a small part of the milk produced in these three counties. Cheese factories and creameries furnish the market for a large part of the milk and cream produced.

(4) Sanitation requirements.

Milk sold in the Dubuque market for consumption as fluid milk or cream must conform to certain specified health regulations. All raw or pasteurized milk or cream sold at retail, as fluid milk or cream must not contain more than 100,000 bacteria per cubic centimeter. Furthermore, milk which is intended for pasteurization by pasteurizing plants and thereafter to be sold or offered for sale within the city of Dubuque at retail as fluid milk or cream must not contain more than 500,000 bacteria per cubic centimeter before pasteurization. These regulations were approved on October 7, 1935. The

Table 12. Disposition of milk produced on farms in the Dubuque Supply Area, 1929

Classification	Dubuque County, Iowa	Jo Daviess County, Illinois	Grant County, Wisconsin	Total
	<u>Million pounds</u>	<u>Million pounds</u>	<u>Million pounds</u>	<u>Million pounds</u>
Total production	96.5	96.9	211.6	399.0
Whole milk sold	15.4	41.6	84.5	141.5
Farm butter sold (milk equivalent)	.7	.1	.2	1.0
Cream sold (milk equivalent)	.4	.4	.5	1.3
Cream sold as butterfat (milk equivalent)	65.6	42.0	105.4	213.0
Milk used on farms	8.4	12.7	21.1	42.2

Compiled from the United States Census of Agriculture, 1930

cost and expense of making the inspections and tests necessary to enforce these regulations is paid out of a fund obtained by the collection of one cent per hundredweight on all milk received or produced by distributors or producer-distributors in this market.

A special milk ordinance No. 112 adopted December 20, 1921, and still in effect, also states that milk sold in the Dubuque market must be produced under certain specified physical conditions. It stated that "after July 1, 1923, or as soon as State aid is available for assistance in obtaining tuberculine tests, all milk sold or distributed in the city shall come from cows free from tuberculosis as shown by tuberculine tests." It also states that buildings used for stabling cows for dairy purposes must be "well lighted, ventilated, drained or constructed" and that they must be "kept clean and in good repair and well painted or whitewashed." Other provisions related to the disposal of manure, location of toilets, health of milkers, and the care of milk.

These regulations tend to increase the cost of producing milk. Prior to October 7, 1935, however, the enforcement of health regulations governing milk sold on this market was very poor. The city employed a part-time man for inspection, picking up samples, etc. As a result only the larger dairies located within or immediately outside of the city limits were inspected. Outside of ascertaining that the cows were tuberculine tested, the dairies of producers selling to distributors were not inspected. Since October 7, 1935, however, a full time inspector has been employed by the city.

The tightening up of health regulations governing the sale of milk in this market can be expected to increase the cost of producing it. The supply of milk may be reduced as a result.

(5) Seasonal surplus.

Seasonal fluctuations in the production of milk in the Dubuque supply area are considerably greater than the fluctuations in consumption of milk in Class I as shown by Table 13 and Figure 2. During the summer months the amount of milk produced by dairymen selling milk on the Dubuque market greatly exceeds the demand of consumers for milk and cream. The surplus is used in the manufacture of various products, such as butter, ice cream, etc. During the summer months a large proportion of the surplus is used in the manufacture of ice cream. During the winter months of 1935 all but about 12 percent of the milk received was used as Class I and Class II.

Under these conditions of supply and demand, the price of milk might fluctuate widely throughout the year if no attempt were made to control the market. During the winter months milk prices would tend to be based upon the demand for milk for consumption as fluid milk or cream, while during the summer months they would tend to be based on the demand for milk in manufacturing ice cream and butter.

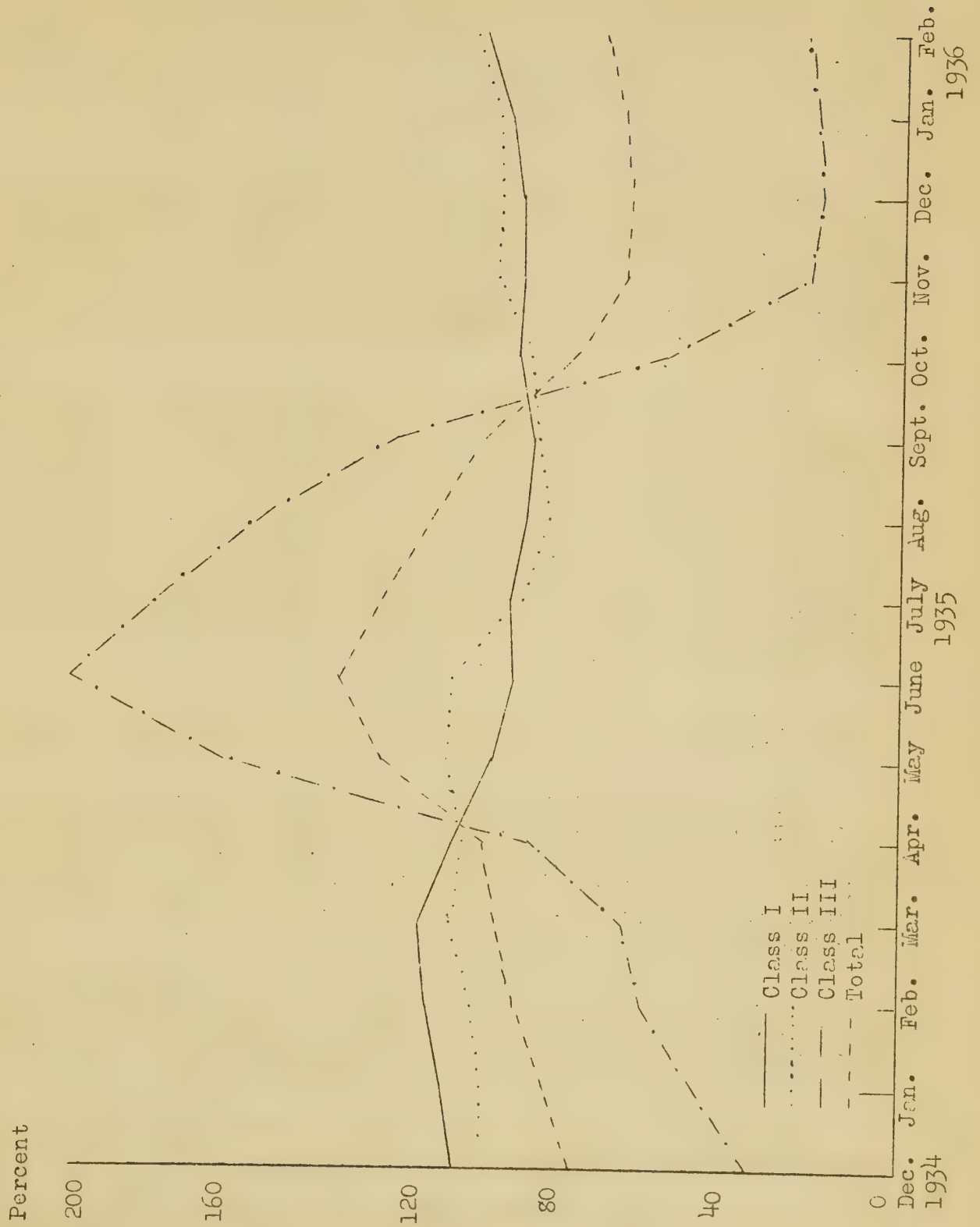
Table 13. DUBUQUE, IOWA: Estimated total volume of milk used by classes, percentage in each class, and index of seasonal variation.

Compiled from reports of the Market Administrator.

Year and Month	Sales			Total Pounds	Percent of Total Sales		Index of Seasonal Variation 1/				
	Class I	Class II	Class III		Class I	Class II	Class III	Total			
	Pounds	Pounds	Pounds		Percent	Percent	Percent	Percent			
1934											
December	563,407	187,491	154,586	905,484	62.2	20.7	17.1	107.5	100.4	36.1	79.5
5-31											
1935											
January	662,095	214,760	243,292	1,120,147	59.1	19.2	21.7	110.2	100.3	49.4	85.6
February	620,861	200,163	276,734	1,097,758	56.6	18.2	25.2	114.4	103.5	62.2	93.0
March	706,584	242,364	333,487	1,276,435	54.9	19.0	26.1	116.6	113.2	67.7	97.6
April	629,297	220,902	430,404	1,280,603	49.1	17.3	33.6	108.2	106.6	90.3	101.2
May	597,045	235,902	513,614	1,346,561	36.3	14.3	49.4	99.4	110.2	165.2	125.9
June	547,965	226,562	961,862	1,735,389	31.6	13.0	55.4	94.2	109.3	201.9	137.2
July	570,331	197,821	887,201	1,655,353	34.5	11.9	53.6	94.9	92.4	180.2	126.6
August	551,555	154,539	769,655	1,506,049	36.6	12.3	51.1	91.8	86.2	156.3	115.2
September	521,786	184,644	589,331	1,295,761	40.3	14.2	45.5	89.7	89.0	123.7	102.4
October	565,629	195,185	291,388	1,052,202	53.8	18.5	27.7	94.1	91.0	59.2	80.5
November	540,423	206,916	113,417	860,756	62.8	24.0	13.2	93.0	99.8	23.8	88.0
December	561,891	210,883	98,956	871,730	64.5	24.2	11.3	93.5	98.5	20.1	86.8
Total	7,083,682	2,525,558	5,790,304	15,399,744	46.0	16.4	37.6	100.0	100.0	100.0	100.0
1936											
January	576,607	213,575	108,506	898,688	64.1	23.8	12.1	96.0	99.7	22.0	68.7
February	576,563	211,171	112,864	900,610	64.1	23.4	12.5	102.9	105.4	24.5	73.5
March											
April											
May											
June											
July											
August											
September											
October											
November											
December											

1/ Average monthly sales in 1935 of each class of milk equals 100.

FIGURE 2:- DUBUQUE, IOWA: INDEX OF SEASONAL VARIATION OF ESTIMATED TOTAL VOLUME
OF MILK USED BY CLASSES



The proposed marketing agreement, however, provides that producers be paid for milk according to the use made of it. That sold as fluid milk is to be paid for at one price, that sold as cream at another price, and that disposed of as ice cream, butter, etc., at still another price. Furthermore, a minimum price is established for all milk sold as fluid milk (Class I). By this arrangement it is expected that some of the decline in prices resulting from a supply of milk in excess of Class I demand can be prevented.

(6) The organization of the milk supply for the Dubuque market.

Approximately three-fourths of the producers shipping milk to the Dubuque market are members of the Dubuque Cooperative Dairy Marketing Association. From December 1934 to June 1935, inclusive, members of this association supplied 65.7 per cent of all milk used in this market. (See Table 14.) During this period they supplied 58.3 per cent of the Class I milk sold, 67.7 per cent of the Class II milk and 74.5 per cent of the Class III milk.

This association was organized in June 1922 and is the only incorporated cooperative association of milk producers in the market. It arranges for the sale of milk produced by its members to handlers in Dubuque, tests the milk delivered by producers for butterfat content and sediment, inspects the books of the dairies to whom it sells, ascertains the use of the milk as to classes, collects from the handlers, and pays the producers for their milk. For these services they received under License No. 94, 4 cents per hundredweight. There are, however, four handlers in the Dubuque market who buy from independent producers who are not members of the cooperative association.

This association also operates a surplus plant and creamery through which it can market any milk that is not sold to handlers in Dubuque.

There is also an association of handlers in Dubuque called the Milk Dealers' Association. Anyone who distributes milk in Dubuque is entitled to membership in the association. The Dubuque Cooperative Dairy Marketing Association is a member. The purpose of this association is to stabilize milk prices. It is, however, not incorporated and is not functioning to any great extent at the present time.

The producer handlers in this market are also organized to some extent. They have an association which is intended to enable them to better protect the interests of raw milk dealers. There is, however, no agreement between its members and no membership dues.

There are also a great many peddlers in this market who buy milk from handlers and distribute it to consumers.

(7) Relation of supply to the margin between prices of Classes I, II and III and prices paid by creameries and cheese factories in the Dubuque marketing area.

There is nothing in the proposed marketing agreement to prevent producers from increasing their production of milk and selling it on the Dubuque market. Nor is any attempt made in the proposed marketing agreement to keep new producers out of this market. Consequently, if the price of Class I milk is established at too high a level the volume of milk

Table 14. DUBUQUE, IOWA: Percentage which milk shipped into Sales Area by Cooperative Members is of estimated total milk in the Market.

	1934						1935					
	Dec.						Jan.					
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Cooperative Members												
Class I	60.4	58.4	56.9	55.9	58.3	59.8	59.4	58.3	59.8	59.4	58.3	58.3
Class II	73.7	71.3	70.0	64.4	66.1	65.3	64.5	66.1	65.3	64.5	67.7	67.7
Class III	83.1	75.3	74.8	74.9	71.4	73.8	74.8	71.4	73.8	74.8	74.5	74.5
Average Total	72.4	69.3	67.2	65.1	65.3	66.3	66.2	65.3	66.3	66.2	65.7	65.7

Compiled from reports of the Market Administrator.

Table 15. Average January prices of feed in Iowa, 1922-1936

Year	Alfalfa Hay per ton	Corn per bushel	Standard Spring wheat bran ¹ / _{per ton}	Cottonseed Meal 41% ¹ / _{per ton}
	<u>Dollars</u>	<u>Cents</u>	<u>Dollars</u>	<u>Dollars</u>
1922	12.10	34		
1923	16.50	58		
1924	15.00	63		
1925	14.20	108		
1926	17.40	60		
1927	21.00	58	29.20	34.50
1928	16.90	72	33.35	48.90
1929	19.00	71	32.90	49.45
1930	14.40	69	28.30	40.00
1931	14.60	56	17.25	30.15
1932	11.50	32	13.75	18.55
1933	7.00	12	-	16.95
1934	8.70	37	17.00	27.35
1935	20.00	87	28.20	40.00
1936	9.50	47	18.38	27.31

Compiled from reports of the Bureau of Agricultural Economics,
Division of Crop and Livestock Estimates

¹/_{Prices at Chicago}

coming into this market can be expected to increase, partly as a result of increased production but mainly because of a shift in the sale of milk from cheese factories in the area to the Dubuque market and a shift in the disposition of milk on farms from the sale of cream for the manufacture of butter and other products to the sale of whole milk on the Dubuque market. Furthermore, a considerable number of dairy farmers deliver their own milk to consumers in Dubuque, and the number would tend to increase if the producer prices established are too low in relation to retail prices. Competitive forces in this market can, therefore, be expected to keep prices closely in line with demand and supply conditions.

(8) Current production conditions of importance in relation to the proposed schedule of minimum prices to producers.

Milk production, as indicated by the estimated total sales of all milk in the market, as reported by the market administrator, was considerably less during the winter of 1935-36 than in the preceding winter. Total sales of milk in this market during January and February 1936 were 19 per cent less than during the same months of 1935.

Feed prices, however, have been considerably lower for the State of Iowa as a whole during the winter of 1935-36 than during the preceding winter. Average prices received by farmers in Iowa for corn declined from 87 cents per bushel in January 1935 to 47 cents in January 1936. Alfalfa hay declined from \$20.00 per ton to \$9.50 during the same period. Standard spring wheat bran at Chicago also declined from \$28.20 per ton to \$18.38 and cottonseed meal from \$40.00 to \$27.31 per ton during the same period. (See Table 15.)

(9) Alternative markets and prices paid therein in relation to prices provided by the proposed marketing agreement and order.

There are a number of alternative markets for milk produced in the Dubuque milk shed. Creameries and cheese factories are scattered throughout this territory as shown by Figure 1. A large proportion of the milk produced in Dubuque County is marketed as cream on a butterfat basis. In Jo Daviess County, Illinois, and Grant County, Wisconsin, a large amount of the milk produced is sold as whole milk to cheese factories.

The average net return received by farmers per hundredweight of milk at each of these types of markets is usually very nearly the same. For instance, in 1935 the average blended price paid farmers by handlers in the Dubuque market was \$1.41 per hundredweight. Since about 30 per cent of this milk is hauled by truckers at 15 cents per hundredweight, a considerable number of farmers sending whole milk to this market received only an average of \$1.26 per hundredweight. During the same year creameries in Dubuque were paying 3 cents per pound of butterfat premium over the price of 92 score butter in Chicago. Since the average price of such butter in Chicago was 28.81 cents per pound in 1935, creameries in Dubuque probably paid approximately 31.81 cents per pound. At this price the butterfat in 100 pounds of milk testing 3.5 per cent butterfat would be worth \$1.11 or 15 cents per hundred less than that received by a farmer paying 15 cents per hundredweight to have his whole milk hauled to the

Dubuque market. The skim milk from a 100 pounds of whole milk has a feeding value in the production of poultry and hogs of more than 15 cents per hundredweight.

Cheese factories in this territory usually pay about 6 to 8 cents premium over 92 score butter prices at Chicago. A premium of 7 cents per hundredweight above the average price of 92 score butter in Chicago in 1935 would have resulted in an average price of 35.81 cents per pound of butterfat in whole milk delivered at cheese factories, or \$1.25 per hundredweight of milk containing 3.5 per cent butterfat. This price is 15 cents below the average blended price paid by handlers in the Dubuque market. Producers of milk delivered to cheese factories, however, do not have to conform to the health requirements of Dubuque.

While there are no condenseries in the Dubuque milk shed, a number of them are located within a hundred mile radius. The average prices paid per hundredweight of whole milk at four of these condenseries in 1935 was \$1.36 per hundredweight of milk compared with an average blended price of \$1.41 paid by handlers in the Dubuque market.

D. Conclusions as to minimum prices to producers specified in the proposed marketing agreement and order.

(1) The Class I price.

The Class I price of \$2.00 per hundredweight provided by the proposed marketing agreement and order is 10 cents higher than that paid by handlers in this market since November, 1935. It is also 10 cents per hundredweight higher than is being paid in the Quad Cities for Class I milk but the same as that paid in the Des Moines market. Receipts of milk by handlers in Dubuque during the winter of 1935-36, however, have been relatively lower than in Quad Cities or Des Moines. Health regulations governing the production and sale of milk in Dubuque have also become more strict, and more fully enforced during the last six months. This would naturally tend to increase the cost of producing milk for the Dubuque market and at the same time tend to decrease the supply of milk available for consumption. There has, also, been a considerable improvement in business conditions since the early part of 1935. It should be noted, however, that Class I sales during January and February, the latest months for which data are available, were about 10 per cent lower than in the same months of 1935. For these reasons the Class I price appears to be slightly high.

(2) The Class II price.

The Class II price of \$1.42 per hundredweight of milk on the other hand appears to be slightly too low. The spread of 58 cents per hundredweight of milk is 25 cents per hundredweight greater than the spread a year ago. It is, however, slightly less than the spread between Class I and Class II milk (defined in practically the same terms as in the proposed marketing agreement and order) in Quad Cities during May and June 1935, but somewhat greater than in other months. The minimum price for Class II milk in the Quad Cities is determined by a formula based largely upon the price of 92 score butter in Chicago and it is not clear why a similar

formula was not established in the proposed marketing agreement and order, instead of a fixed price. The arguments in favor of having a separate class for cream, indicate that the price of Class II milk should be determined by a formula which would cause the Class II price to vary with the market price of butterfat.

(3) The Class III price.

The principal use of surplus milk not sold as Class I or Class II is in the manufacture of ice cream, butter, cheese and other products. Some of it, however, may be used in the manufacture of chocolate milk, flavored milk drinks, creamed cottage cheese and creamed buttermilk. Milk used for such purposes is included in Class I in some markets. During the summer most of this milk is used in the manufacture of ice cream. The price paid for Class III milk must, therefore, conform closely to the value of it for such uses. The proposed marketing agreement and order states that each handler shall pay producers in the manner set forth in Article VIII, not less than 3.5 times the average price per pound of 92 score butter at wholesale in the Chicago market, as reported by the United States Department of Agriculture for the delivery period during which such milk is purchased, plus 15 cents. This price, at the present time, (May 28, 1936) is 5 cents per hundredweight above the Class IV price in Quad Cities and 14 cents below the Class III price. In the Quad Cities market Class III milk is milk used to produce evaporated milk, ice cream or ice cream mix, and Class IV milk is that used in the manufacture of butter and other dairy products. Furthermore, as noted on page 17, the class III price for milk in Dubuque, calculated according to the same formula as that specified in the proposed marketing agreement and order, from August 1, 1935 to December 15, 1935, the only period for which data are available, was about 10 cents per hundredweight less than that paid by cheese factories in this area.

It should, however, be noted that the prices specified in the proposed marketing agreement and order are minimum prices and that the Dubuque Cooperative Dairy Marketing Association controlled about 74.5 per cent of the estimated total amount of class III milk used in this market from December 1934 to June 1935 inclusive, the only period for which data are available. This cooperative operates a surplus plant and is in a position to get the full market value for this milk. Furthermore, the volume of Class III milk handled by other dealers is small. Some of them may, because of a small volume and perhaps lack of facilities be able to obtain more than the specified minimum price for such milk plus a reasonable return for their labor, equipment, etc. used in marketing this milk. There may, therefore, be good reasons for establishing a relatively low minimum price for Class III milk in this market. Sufficient facts, however, are not available upon which to base any final conclusion.

On the basis of the foregoing facts and considerations it appears that the schedule of Class I and Class III prices specified in the proposed marketing agreement and order may be justifiable. While the Class I price appears to be slightly high, the Class III price appears to be too low. They may average out satisfactorily from the standpoint of the farmer, but

additional information is needed before this fact can be determined. With respect to Class II milk there does not appear to be sufficient reason for establishing a fixed price in place of a formula price, in the proposed marketing agreement and order.

Part V.

Other Provisions of the Proposed Marketing Agreement and Order

The remaining provisions of the proposed marketing agreement and order are necessary for the purpose of making effective the classification and price provisions previously discussed.

A. The Dubuque Marketing Area, as defined in the proposed marketing agreement and order means the territory within the corporate limits of the city of Dubuque; the territory within the township of Dubuque; sections 1, 2, 3, 11 and 12 of the township of Table Mound; and sections 5 and 6 of the townships of Mosalem, all in the county of Dubuque in the State of Iowa.

B. Other definitions. "Person" means any individual, partnership, corporation, association, or any other business unit. In the milk industry, practically all types of business organization are to be found. Hence, in order that all handlers subject to regulation in a milk market be regulated, it is necessary that all possible types of business organization be specified and the proposed marketing agreement and order be made applicable thereto. If this were not done, some persons would be exempt from the provisions of the proposed marketing agreement and order even though the character of their business were such that they were subject to regulation. This would operate to cause the regulatory aspects of the proposed marketing agreement and order to be very discriminatory between different firms, and it is to obviate this inequitable result that "person" is so defined as to cover all types of business organization.

"Producer" means any person, irrespective of whether any such person is also a handler, who produces milk in conformity with the health requirements applicable for milk to be sold for consumption as milk in the Dubuque Marketing Area. Milk which does not meet these requirements cannot legally be sold for consumption as fluid milk in the Dubuque Marketing Area, hence the handlers of such milk should not be subject to any proposed marketing agreement and order relating to such milk. But all milk which meets the health requirements is in actual or potential competition with all other such milk, and handlers of such milk must be subject to any proposed marketing agreement and order for such to be effective in regulating the handling of such milk.

"Handler" means any person, irrespective of whether such person is a producer or an association of producers, wherever located or operating, who engages in such handling of milk, which is sold as milk or cream in the marketing area, as is in the current of interstate or foreign commerce, or which directly burdens, obstructs, or affects interstate or foreign commerce in milk and its products.

One of the major objectives of this proposed marketing agreement and order is to place all handlers on a comparable basis with respect to the purchase price they are required to pay for milk sold in the several use classes. In order that this major purpose of the proposed marketing agreement and order be accomplished, all persons involved in the handling of milk and its products in interstate commerce, or so as to burden,

obstruct, or affect interstate commerce, must be subject to the proposed marketing agreement and order. All types of business setups and organizations are found. Hence, the definition of a handler must be broad enough to include all those persons who are in competition with each other so that no provision of the proposed marketing agreement and order be discriminating in effect with respect to different firms or persons.

C. Market administrator and provisions relating thereto.

Selection, Removal and Bond. In order that the Secretary can be assured that the administration of the proposed marketing agreement and order is being carried out without any bias in favor of or against any group in the Dubuque Marketing Area, it is necessary that he appoint the market administrator. This procedure has been followed in all Federal milk licenses, due to the fact that it has proven more feasible than other types of administrative organization. The person selected needs to be one of wide experience and one with complete understanding of the proposed marketing agreement and order. In order further to insure unbiased administration of the proposed marketing agreement and order, it is necessary that the market administrator, selected by the Secretary, be subject to removal by the Secretary and only the Secretary. For further assurance to all concerned of the faithful and honest performance by the Market administrator of his duties, the market administrator is required to execute and deliver to the Secretary a bond in such amount as the Secretary may determine, with surety thereon satisfactory to the Secretary.

Compensation. The Secretary determines the salary of the market administrator he selects. This salary is considered an expense of administering the proposed marketing agreement and order.

Duties. In order that there shall be proper administration of the proposed marketing agreement and order, the market administrator must:

1. Keep such books and records as will clearly reflect the financial transactions provided for in the proposed marketing agreement and order. In order for the Secretary to be assured, and to assure producers and handlers of proper administration of the proposed marketing agreement and order, the books and records of the market administrator must be subject to his examination at any and all times. Only by being so assured can the Secretary know definitely that the proposed marketing agreement and order is effectuating the policy of Congress as stated in the Agricultural Adjustment Act.

2. In order for the Secretary to be informed, furnish such information and verified reports as the Secretary may request.

3. In order to assure that his duties, for which the Secretary is responsible, are being properly carried out by his employees, obtain a bond for each employee who handles funds entrusted to

the market administrator under the provisions of the proposed marketing agreement and order. Most of the money handled in the Administrator's office belongs to handlers or producers, and the bond would cover possible losses to them. This insurance being necessary to the proper administration of the proposed marketing agreement and order, the expense of such bond should be a part of the expense of administration.

4. Publicly disclose, except as otherwise directed by the Secretary, the name of any person who has not:

(1) Made reports pursuant to article V of the proposed marketing agreement and order. These reports are the only way in which the administrator can determine in a reasonable length of time sales made by each handler in each class, etc. These reports are necessary in order that prices to producers be computed by the market administrator and the purpose of the proposed marketing agreement and order be effectuated. If the handler pays his producers without filing these reports, other handlers and also the producers should be informed that that handler had not filed reports and that the Administrator could not determine if the handler had paid the correct prices for his milk. If the producers are not so informed, they might assume that they had been paid the correct price. The Administrator must make it known that he had not verified the prices paid and, therefore, was not responsible for its correctness.

(2) Made payments pursuant to article VIII of the proposed marketing agreement and order. The market administrator obtains information to compute the price that shall be paid by each handler and also obtains information as to what price was paid. With no notice to the contrary, a producer might assume that the price he received was the one to which he was entitled, when in fact, it might be different from what the market administrator had computed as being correct. Because the producer might make such an incorrect assumption, the market administrator must notify such producers that the prices paid by the handler were not those computed by the market administrator. All handlers will be in the same competitive position only if they pay the price as computed by the Administrator. The other handlers in the market in order to be on equal competitive terms must know the names of those competitors who have not paid the same price for their milk (subject only to deviation adjustments) as they have.

Responsibility. The market administrator, in his capacity as such, however is not held responsible in any way whatsoever to any handler or any other person for errors in judgment, for mistakes, or for other acts either of commission or omission, except for his own willful misfeasance, malfeasance or dishonesty.

D. Inter-handler sales. (Section 2 of article III of the proposed marketing agreement and order.) Milk sold by a handler to

another handler shall be presumed to be Class I milk. In the event that such selling handler or person who is not a handler, on or before the date fixed for filing reports pursuant to article V, notifies the market administrator that such milk, or part thereof, has been sold or used by the purchaser other than as Class I milk, such milk, or part thereof shall be classified according to such notification; provided, that if such selling handler does not, on or before the 10th day after the end of the delivery period during which such sale was made, furnish proof satisfactory to the market administrator in support of the above notification, such milk or part thereof shall then be classified as Class I milk and so included in the value of milk computed for the selling handler pursuant to section 1 of article VIII.

The proposed marketing agreement and order is designed to place all handlers on a comparable basis with respect to the purchase price they are required to pay for milk sold in the several use classes. This objective can be accomplished only by a close check on the ultimate use of the milk. In the process of marketing, milk often passes through several handlers before it reaches the ultimate user. The handlers who purchase milk and cream are so numerous, of such varied character, and often so sporadic in their purchases that the market administrator would have, practically, an impossible task to perform to check each sale of milk and cream to other handlers to be sure he knew the ultimate use of that milk and cream.

Hence, the efficient and economic procedure is to charge this milk and cream sold to another handler at the Class I price at some point before it starts its devious routes to the ultimate consumer. But, at the same time, allowance is made so that the selling handler, if he does sell the milk and cream for other uses than Class I, is charged the prices applicable to such uses. In this way only can the administrator be sure that the milk and cream sold by all handlers cost each handler the same.

E. Individual handler pool. There is provided in the proposed marketing agreement and order a plan whereby each handler pays a uniform price for all milk purchased by him. This is called an individual handler pool. The market-wide pool has been tried in this market under the license, with resulting opposition on the part of a considerable number of handlers and producers in the area. Some handlers do not like to make net payments into an equalization fund, while other handlers draw out more than they pay in. Some producers also tend to receive higher prices under the individual handler pool than under the market-wide pool. Other producers, of course, receive less. Naturally those producers adversely affected oppose such a plan. There are also a number of other factors which make the individual handler pool more desirable than the market-wide pool under the proposed marketing agreement and order. In the first place, this is a small market. Approximately 70 percent of the milk received by handlers is delivered by producers. Such producers

can shift from one handler to another quite easily. In the second place, approximately three-fourths of the milk received in this market will be included in one pool, that of the Dubuque Cooperative Dairy Marketing Association, and paid for at a uniform price. Finally, there is the fact that from December 1934 to June 1935, inclusive, the calculated average price of milk for each handler in the market varied little from the average pool price for the entire market. See Table 16.

F. Computation, accounts and payments. Article V of the proposed marketing agreement and order sets forth three types of reports which handlers are required to submit and provides for the verification of these reports. The necessity for all these reports and for their verification becomes apparent with the realization of the nature of a milk market and practical operating problems which arise in making effective the class prices in the payments to all producers which reflect the utilization of milk by each handler to whom they deliver milk.

Section 1 requires handlers to submit reports to the market administrator on or before the fifth day after the end of each delivery period, showing:

1. The receipts at each plant from producers who are not handlers;
2. The receipts at each plant from any other handler, including any handler who is also a producer;
3. The quantity, if any, produced by such handler; and
4. The respective quantities of milk which were sold, distributed, or used, including sales to other handlers, for the purpose of classification pursuant to article III.

Section 2 provides for other reports with respect to producers delivering milk to a handler, to be made at the request of the market administrator. These reports enable the market administrator to secure needed information with respect to producers after a handler has newly become a party to the agreement or to request information not already in his hands which is needed for full knowledge in order to effectuate and to determine the effects of the marketing agreement and order in relation to the policy of the Act. The second report provided for under section 2 requires that each handler report to the market administrator upon first receiving milk from any producer who has not previously shipped milk to the handler, in order that the market administrator may keep his records up to date with respect to producers delivering

Table 16. Comparison of prices that would have been paid by each milk handler in Dubuque, if calculated on the basis of minimum prices for each class of milk and reported sales of milk in each class, by months, December 1934 to June 1935. 1/

Month	Number I Handlers	Number II Handlers	Number III <u>2/</u> Handlers	Number IV Handlers	Number V <u>2/</u> Handlers	Number VI Handlers	Weighted average for six dairies
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
December 1934	1.573	1.561	1.487	1.564	1.589	1.565	1.490
January 1935	1.509	1.568	1.520	1.554	1.511	1.543	1.521
February 1935	1.544	1.616	1.557	1.562	1.567	1.563	1.551
March 1935	1.455	1.544	1.472	1.526	1.497	1.525	1.480
April 1935	1.493	1.513	1.477	1.504	1.523	1.541	1.490
May 1935	1.358	1.283	1.296	1.340	1.381	1.344	1.284
June 1935	1.266	1.209	1.182	1.299	1.311	1.255	1.185
Average (7 mos.)	1.429	1.430	1.401	1.460	1.466	1.451	1.437

1/ Calculated by weighting the average price for each class as determined under the license, by the quantity of milk used in each class, by each handler and by all handlers.

2/ Companies buying all of their milk from the Dubuque Cooperative Dairy Marketing Association. Other companies may also buy a portion of their milk from the Cooperative.

to each handler and to the coming into the market of producers who did not market milk regularly, for thirty days prior to the effective date of the marketing agreement and order.

Section 3 provides for the regular reporting by handlers of their payments to producers for each delivery period in the form of a copy of the handler's producer payroll. Such a report expedites the routine checking of compliance with the marketing agreement and order, and provides in an economical way the information necessary for the market administrator to maintain adequate producer records.

Section 4 provides that each handler shall permit the market administrator to verify the information contained in all reports. The importance of routine verification of all reports is readily understandable in view of the intricate and detailed transactions which are inherent in the milk business. Where errors both willful and accidental may so readily creep in and effect the returns to producers, successful operation of a marketing agreement will depend to a large extent upon the extent to which the market administrator assures himself of the correctness of the figures supplied him in the reports and of the correctness of the sampling, weighing and testing of butterfat of the milk which is delivered by producers. Such routine verification is thus extremely necessary for the effectuation of the provisions of the marketing agreement and order.

Article VII of the proposed marketing agreement and order provides for the calculation and announcement of a uniform pool price for all milk purchased by each handler. For each delivery period, the market administrator is required to compute, subject to the provisions of article VI, pertaining to handlers who are also producers, the value of all milk sold or used by each handler, which was not purchased from other handlers, by (a) multiplying the quantity of such milk in each class by the price applicable pursuant to article IV, and (b) adding together the resulting value of each class. A uniform price is also calculated for each handler for each delivery period by dividing the total value thus obtained by the total quantity of milk for which such value is computed. The market administrator is required to notify each handler, on or before the tenth day after the end of each delivery period, of the uniform price calculated for all milk purchased by him, and to publicly announce these prices on or after the fifteenth day after the end of each delivery period.

Article VI of the proposed marketing agreement and order provides that in calculating the uniform price to be paid for milk purchased from producers by each handler who is also a producer, the milk purchased by him in each class, from other handlers shall first be excluded, and the milk purchased from producers apportioned to each class according to the ratio which such handler's remaining total sales in each class bears to his remaining total sales in all classes.

G. Payments for milk.

Article VIII of the proposed marketing agreement and order provides

that the minimum class prices shall be paid by handlers for each delivery period, not later than the 15th day following the delivery period, in the form of a blended average price for all milk purchased from producers by each handler, subject to a specified butterfat differential. If any producer has delivered to any handler during any delivery period, milk having an average butterfat content other than 3.5, section 3 provides that such handler shall pay, for each one-tenth of one percent of average butterfat content above 3.5 percent, or shall deduct, for each one-tenth of one percent of average butterfat content below 3.5 percent one-tenth of the average price of 92-score butter at Chicago, per hundredweight, but not less than 3 cents and not more than 4 cents.

H. Deduction for marketing services.

The Agricultural Adjustment Act, as amended, states that the Secretary of Agriculture may provide for marketing services as follows, (Section 8c (5) (F)):

"Providing (i) except as producers for whom such services are being rendered by a cooperative marketing association qualified as provided in paragraph (F) of this subsection (5) for market information to producers and in the verification of weights, sampling and testing of milk purchased from producers and for making appropriate deductions therefor from payments to producers"

Under the License (No. 94), which has been in effect in this market since December 4, 1934, provision was made for performing such marketing services for all producers selling milk to handlers in this market. The cost of such services was paid from a fund collected by the market administrator from distributors. Each distributor was required to deduct 4 cents per hundredweight from payments to producers on all milk delivered to him during each delivery period, and pay it to the market administrator.

The Dubuque Cooperative Dairy Marketing Association performed the required marketing services for its members, and were reimbursed by the market administrator. Since this cooperative makes all payments to its producer members, it, in effect, merely deducted the 4 cents per hundredweight and paid for its marketing services, without having the funds pass through the hands of the market admin-

Table 17. - License No. 94, Dubuque Sales Area:
Expenditures from the administrative fund
during the twelve month period ending
March 31, 1936.

Expense item	Amount
	<u>Dollars</u>
Salaries	3130.59
Rent	-
Travel expense	384.75
General expense	<u>698.24</u>
Total	4,213.58 <u>1/</u>
Cost per cwt. of milk	.03072 <u>1/</u>

Compiled from records of the Market Administrator under License no. 94

1/ This figure is exclusive of amounts spent for physical assets such as office furniture, calculating machines and other equipment, and upon which no depreciation has been charged.

Table 18. License No. 94, Dubuque Sales Area: Comparative
balance sheets as of March 31, 1935 and March 31, 1936.

	March 31, 1935	March 31, 1936	Increase or Decrease
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
Assets:			
Cash in banks	55.75	33.57	-22.18
Cash on hand	25.00	25.00	-
Accounts receivable- distributors	38.78	109.29	70.51
Furniture and Equipment	591.77	594.95	3.18
Prepaid premium-surety bond	16.68	-	-16.68
	727.98	762.81	34.83
Liabilities:			
Accounts Payable			
Trade creditors	845.03	467.50	-377.53
Quad Cities Sales Area	-	203.95	203.95
Accrued salaries	-	50.00	50.00
Total	845.03	721.45	- 123.58
Notes Payable	150.00	-	- 150.00
Trustee Account	- 267.05	41.36	308.41
	727.98	762.81	34.83

Based upon audits of the books of the Market Administrator under License No. 94.

istrator. Distributors buying from non-members of the cooperative association, however, were required to pay to the market administrator 4 cents per hundredweight on all milk received from such producers. The market administrator then arranged for the necessary marketing services for these producers.

No provision, however, is made under the proposed marketing agreement and order for such services. There does not appear to be any appreciable demand for such services on the part of producers selling milk in this market who are not members of the Dubuque Cooperative Dairy Marketing Association, and the association can continue to perform any marketing services that are considered necessary by its members, without including a provision for marketing services in the proposed marketing agreement and order.

1. Expenses of Administration. (Article X of the proposed marketing agreement). The market administrator must necessarily incur many expenses in his operations: Must maintain a personnel sufficient to (a) compute periodically the prices to be paid by handlers to producers and determine the adjustments from those prices, (b) record and audit the sales reports of handlers, and (c) provide for contract work with handlers and other parties in the market.

Table 17 shows the costs other than for furniture and office equipment incurred in the administration of License No. 94 during the year ending March 31, 1936. These costs amounted to \$.03072 per hundredweight of milk or slightly more than the check-off of three cents per hundredweight allowed under the license. No allowance, however, has been made for depreciation of furniture and office equipment during this period, which on March 31, 1936 was carried on the books as an asset at its full purchase value, \$594.95. (See Table 18)

Under Article X of the proposed marketing agreement and order, a maximum check-off of 4 cents per hundredweight of milk is provided. This increase in the maximum check-off that can be charged from 3 to 4 cents per hundredweight is said to be necessary because of the fact that expenses have been running slightly more than receipts under the license and in order to provide for more adequate auditing of the sales reports of handlers. A budget of proposed expenditures by the market administrator during the first year, however, is necessary before passing upon the proposed increase in check-off.

THE PRICE STRUCTURE FOR MILK

Technical Paper No. 1, Dairy Section,
Agricultural Adjustment Administration,
United States Department of Agriculture.

THE PRICE STRUCTURE FOR MILK

by

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Introduction

One of the most important and perplexing problems encountered in milk marketing is that pertaining to the classification of milk. This problem is merely one of many, although fundamental and probably the most important, that may and perhaps must be approached through a study of the price structure for milk.

This paper was written for use in connection with marketing agreements and orders for milk. However, numerous questions have arisen pertaining to the classification of milk, the price structure, and related problems, and it is for these reasons that this paper is made available at this time.

This analysis of the price structure has been developed under assumptions of competitive conditions. Numerous details have been omitted in the interest of brevity and in order that the discussion be suitable for general use. The analysis will be expanded as rapidly as possible, and the later phases of the work are to deal primarily with the price structure when the assumptions upon which this paper is based are varied.

The authors have received aid from several persons in the development of this paper. Dr. Warren C. Waite helped draft the paper in all but the latest stages of its development, and Dr. Harold B. Rowe contributed many valuable suggestions relative to the technique of the analysis. Others have made fruitful suggestions and have aided materially in editing the paper.

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Part I

THE PRICE STRUCTURE FOR MILK FOR THE COUNTRY AS A WHOLE

A complete analysis of the price structure for milk for the country as a whole would fill a rather sizable volume. However, for the purposes of this paper, it is unnecessary to devote a great deal of time and space to the development of such an analysis. All that is intended in Part I is to develop a rather general treatment of the price structure for milk for the country as a whole, in order that the analysis of the price structure for milk within a milk shed may be approached more satisfactorily.

An explanation of the price structure for dairy products for the country as a whole involves consideration of (1) the conditions affecting the demand for milk, and (2) the supply characteristics of milk with respect to the localization of particular phases of the industry and the interchangeability of milk between different dairy products. Likewise, an explanation of the price structure for milk within a particular area or a particular milk shed involves consideration of (1) the nature of the demand for the different products derived from milk, and (2) the conditions affecting the supply of milk.

A. The nature of the demand for milk. It is well recognized that the demand for any commodity is a composite of the demands of the different groups of people who are ready to purchase different quantities of it at different prices. Similarly, the demand for a product such as milk, which is used in the production of a number of different products, ^{1/} is

1/ In 1932 the total volume of milk used in the manufacture of dairy products and used by the non-farm population as fluid milk and cream was distributed among the various uses as follows:

Product	Percent of total volume used
Butter - creamery and whey	45.6 ^{a/}
Other manufactured products	13.2 ^{a/}
Milk used by non-farm population as fluid milk and cream	41.2 ^{b/}
Total	100.0

a/ Compiled from estimates of the production of manufactured dairy products, Bureau of Agricultural Economics, U. S. Department of Agriculture.

b/ Compiled from Estimates of Consumption of Milk and Cream in Cities and Villages, Bureau of Agricultural Economics, U. S. Department of Agriculture.

the aggregate or composite demand for milk in all uses. Thus, although the different forms or products in which milk is used are competitive in the sense that each use competes with all other uses for a portion of the total supply of milk, and the derived demands are rival or competitive, in the aggregate they comprise the total demand for milk. The nature of the demand for fluid milk is discussed at length in Part III of this paper.

B. The supply characteristics of milk.

1. Localization of the industry. Although milk production is an important agricultural enterprise in practically every State in the United States, it nevertheless varies markedly between areas as to relative importance and is highly concentrated in certain areas. An important factor in this connection is the fact that the transportation system has developed so that certain areas possess a comparative advantage in the production of milk for use in the production of dairy products that are readily storable and transportable, and others have a comparative advantage in the production of milk for fluid consumption. Thus, the States of Iowa, Minnesota, Nebraska and Wisconsin produced 44.8 percent of the total volume of creamery butter produced in the United States in 1932 and 1933. Wisconsin and New York produced 64.8 percent and 62.1 percent of the total volume of cheese produced in the United States in 1932 and 1933, respectively. Of the total United States production of evaporated milk in 1933, Wisconsin and California produced 53.3 percent, and the five States of Wisconsin, New York, California, Illinois and Ohio produced 70.0 percent. ^{2/} In those areas wherein large urban centers are situated, notably the New England and Middle Atlantic areas, as well as in the territory immediately surrounding other urban centers, the larger part of the total volume of milk produced is utilized in the form of fluid milk and cream.

2. The interchangeability of the supply of milk between uses. The milk supply of the country is interchangeable between uses, especially so in the case of manufacturing uses. In general, there is little difference between the quality requirements for milk used in the production of evaporated milk, butter, cheese and other manufactured dairy products. In addition to the fact that milk is markedly interchangeable between the uses noted above as far as quality requirements are concerned, processing facilities for the different products are so intermingled geographically, and, in fact, are in many cases available in one plant, that the matter of the location of the producer with respect to processing facilities for the different products is usually not important in

^{2/} Manufactured Dairy Products; Bureau of Agricultural Economics, United States Department of Agriculture.

preventing producers from shifting their milk from one channel of disposal to another. Thus, should relative price conditions warrant, the producer can in most cases shift his milk from one use to another. In the case of those plants manufacturing two or more products, the producer does not have to shift his milk from one plant to another, the shift or change in the relative volume of milk entering the different uses being accomplished by the plant management, and for the same reason that would lead the farmer to shift his milk from one use to another.

The interchangeability of the supply of milk between milk produced for use as fluid milk and that produced for use in the production of various manufactured dairy products is not so marked as is the interchangeability of milk between the different manufactured products. This is due in large part to the fact that in most milk markets milk used as fluid milk must be produced in accordance with more stringent sanitary requirements than is the case with milk produced for use in manufactured dairy products. However, this factor operates, principally, to lengthen the period of time necessary for a producer to shift his disposal of milk from manufactured dairy products uses to fluid use. The producer, in order to shift from the production of manufacturing milk to the production of fluid milk, must equip his barn and follow the procedure with respect to sanitation that is specified in the health ordinances of the city or town in which he wishes to sell fluid milk. This involves additional expense in producing milk, but, if the farm price of fluid milk is sufficiently above the farm price of manufacturing milk, the producer will equip his barn and conform to sanitation regulations in order that he may sell fluid milk. Thus, although the degree of interchangeability of milk between fluid use and manufactured product uses is less marked than the degree of interchangeability of milk between the different manufactured product uses, producers can and do shift from the production of manufacturing milk to the production of fluid milk when price relationships warrant. Similarly, when the price of fluid milk declines to a point where it is not sufficiently high to cover the additional costs of producing milk for fluid consumption, producers discontinue the production of milk for consumption as fluid milk and produce milk for use in the production of manufactured dairy products.

C. Factors affecting the general level of the prices of dairy products.

1. Demand factors. Numerous factors influence the demand for dairy products, such as the volume of the money income of consumers, consuming habits, etc. Perhaps the most important of the factors affecting the demand for dairy products is the volume of money consumers have available for the purchase of goods. Thus, the prices of dairy products vary directly with the income of consumers (assuming constant supplies). The relationship between the index of the farm prices of dairy products and

the index of factory payrolls (taken as a measure of changes in the income of consumers) is shown in Figure 1. As was stated above, numerous factors affect the demand for milk. However, for the purposes of this paper, it is unnecessary to discuss them in detail.

2. Factors affecting the supply of milk. The changes in the volume of milk that will be forthcoming from a given number of cows due to changes in weather, pasture and crop conditions need no comprehensive treatment here, since it is obvious that sudden and wide variations in the weather, droughts and other unusual weather conditions that operate to reduce or increase the quantity and quality of feed relative to the number of livestock, all tend to cause variations in the supply of milk.

Aside from the factors noted above, changes in the prices of dairy products relative to the prices paid by milk producers for the articles used in milk production, as well as changes in the prices of dairy products relative to the prices of other farm products, affect the volume of milk produced. In the Middle West, for example, changes in the prices of competing farm products have an important effect on milk production. An increase in the price of beef, or a relative decline in the prices of dairy products, is sufficient to cause large numbers of farmers in this section, particularly in the area west of the Mississippi, to turn to raising beef steers and heifers and let the calves suckle the cows longer than was the practice before the change in relative prices. In addition, in numerous cases where more than one livestock enterprise is followed on the farm, a relatively larger volume of the feed available is fed to livestock other than milk cows when prices of alternative livestock products become favorable relative to the prices of dairy products.

D. Relationships between the prices of dairy products in different markets.

Since most manufactured dairy products are readily transportable, the price of a product such as butter tends to vary between markets by not more than the amount necessary to cover the cost of shipping the product (freight and handling costs) from one market to another. Thus, in Chicago, Illinois, situated in the large surplus butter-producing area comprising the East North Central and West North Central States, the price of butter is generally lower than in New York City by an amount sufficient to cover freight and handling charges from Chicago to New York City (New York City being located in a deficit butter-producing area). The decidedly close relationships between the prices of butter in different markets are shown in Figure 2.

The prices of cheese in different markets vary together (see Figure 3), partly for the same reasons as those advanced above with respect to butter and also because of the possibility of shifting from cheese production to the production of butter, which is more widely

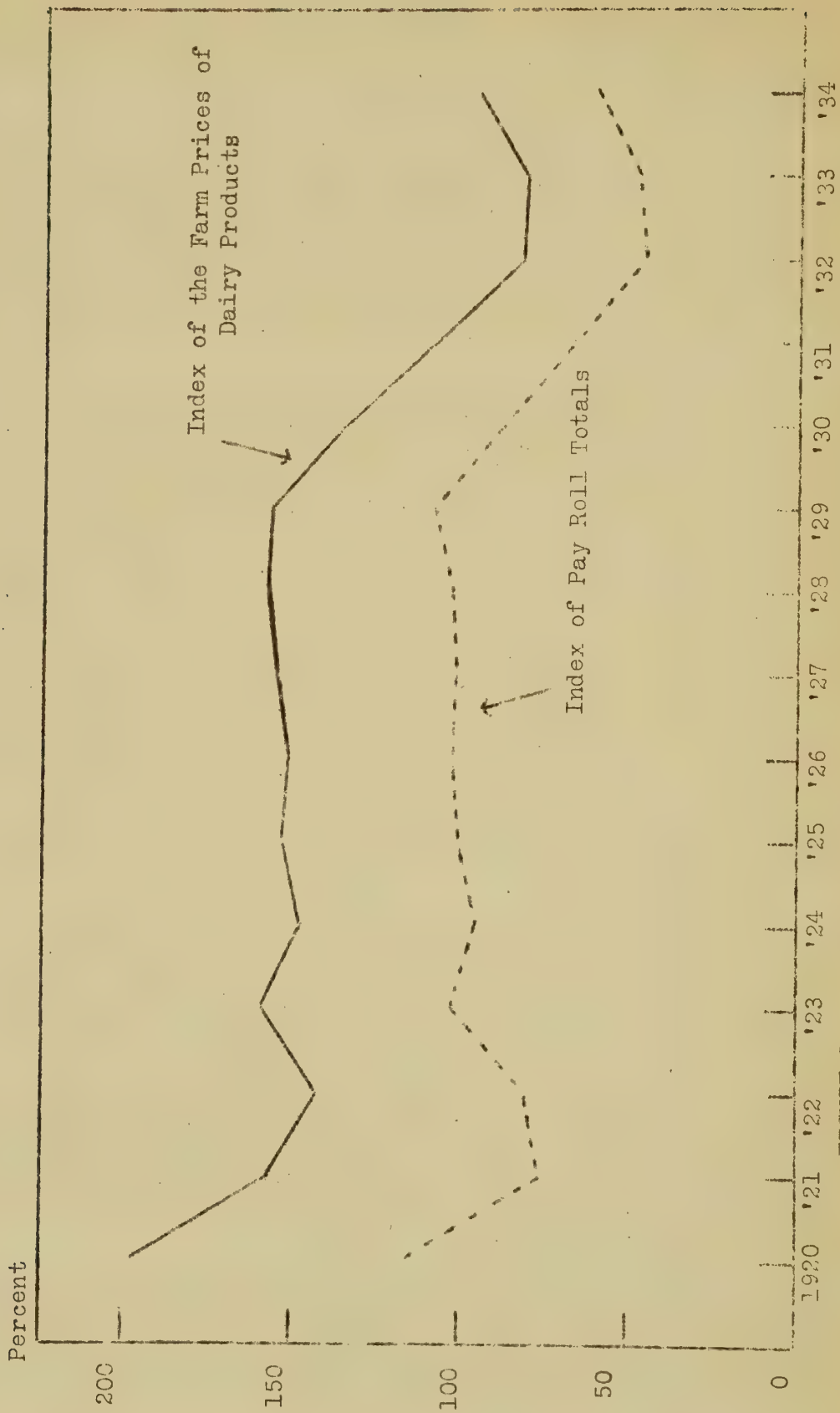


FIGURE 1. - INDEX NUMBERS OF U.S. FARM PRICE OF DAIRY PRODUCTS
(AUGUST 1909 - JULY 1914 = 100)

AND INDEX NUMBERS OF PAY ROLL TOTALS IN MANUFACTURING
INDUSTRIES (1923-1925 = 100)
1920-1934

transported. The same relationships exist with respect to evaporated milk.

In view of the foregoing, it should be evident that the market for the most important manufactured dairy products is national in character and that the price of milk or butterfat used in the different products noted above in any particular area is closely associated with the price of milk so used in any other area.

E. Relationships between the price of milk used in different products.

As was pointed out in B above, the supply of milk is markedly interchangeable between uses in the case of milk produced for manufacturing purposes and to a lesser extent between fluid milk and manufacturing milk uses. This factor operates to establish close relationships between the price of milk in different uses, in the country as a whole, as well as within areas. (See Figure 4.) Thus, although the price of milk produced for use as fluid milk is generally higher in any particular area than the price of milk produced for use in manufactured dairy products (for the reasons advanced in section B and section C), and therefore the market for fluid milk in any particular area may be considered as a local market, the price of milk produced for use as fluid milk varies with the price of such milk in any other area and also varies with the price of milk produced for use in manufactured dairy products, both for the country as a whole and in the different sections of the country.

Table 1. Wholesale prices of butter and cheese, index numbers of milk prices and index numbers of payroll totals, 1920-1934.

[illegible]

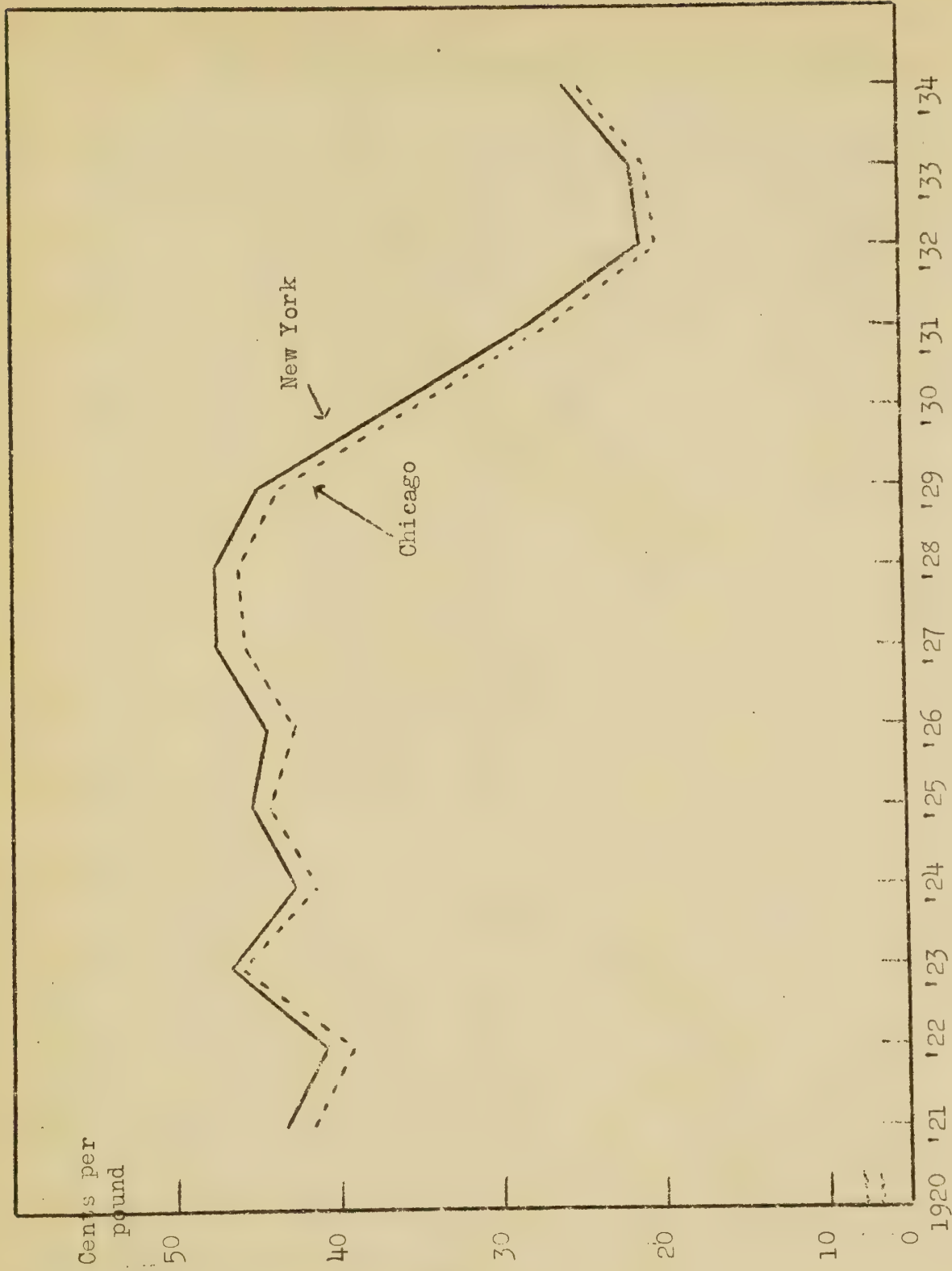


FIGURE 2. - WHOLESALE PRICE OF 92-SCORE CREAMERY BUTTER AT NEW YORK CITY AND CHICAGO, 1921-1934.

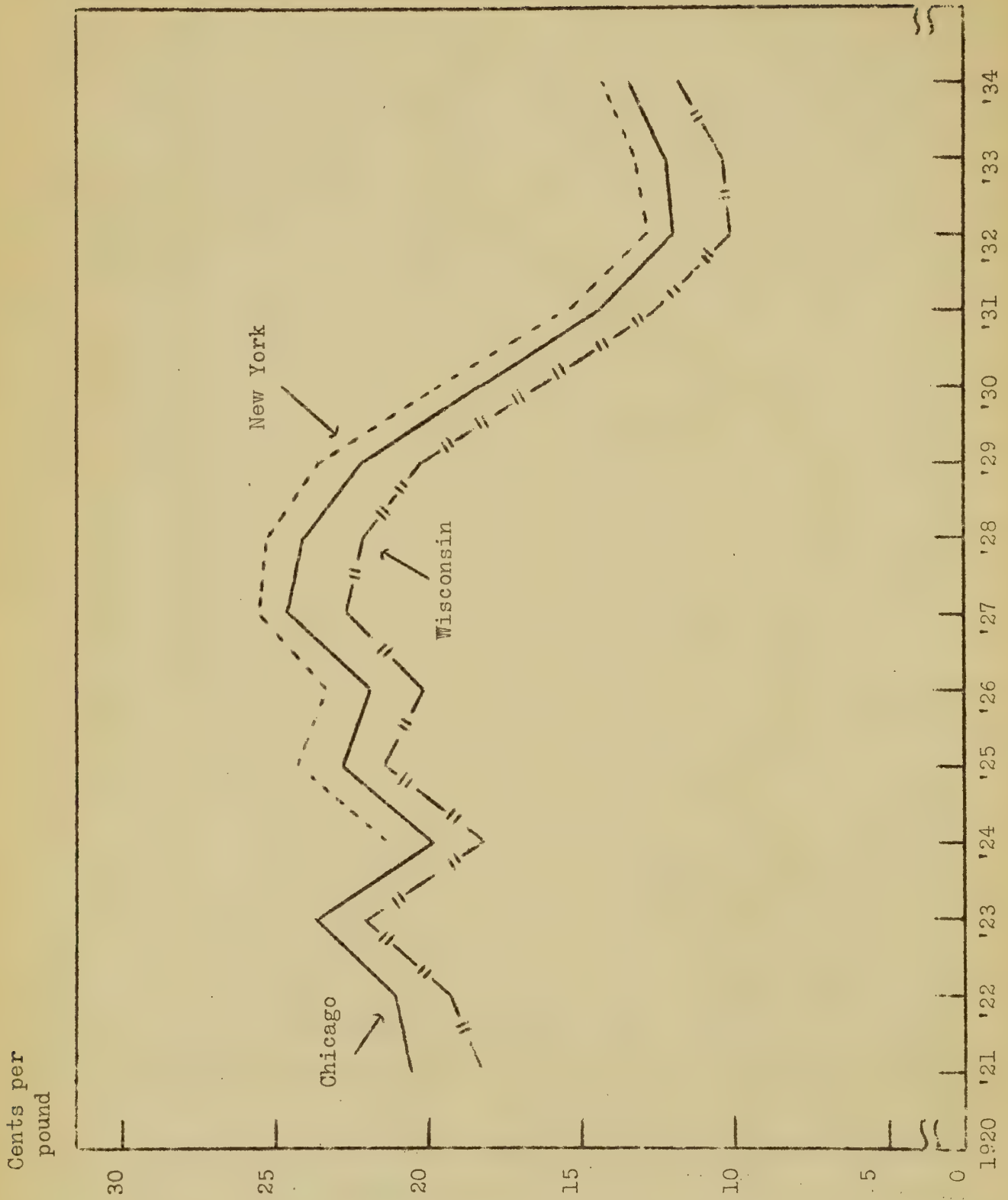


FIGURE 3. - WHOLESALE PRICES OF AMERICAN CHEESE - NEW YORK SINGLE DAISIES, CHICAGO SINGLE DAISIES, AND WISCONSIN T'INS (ON THE WISCONSIN CHEESE EXCHANGE), 1921-1934.

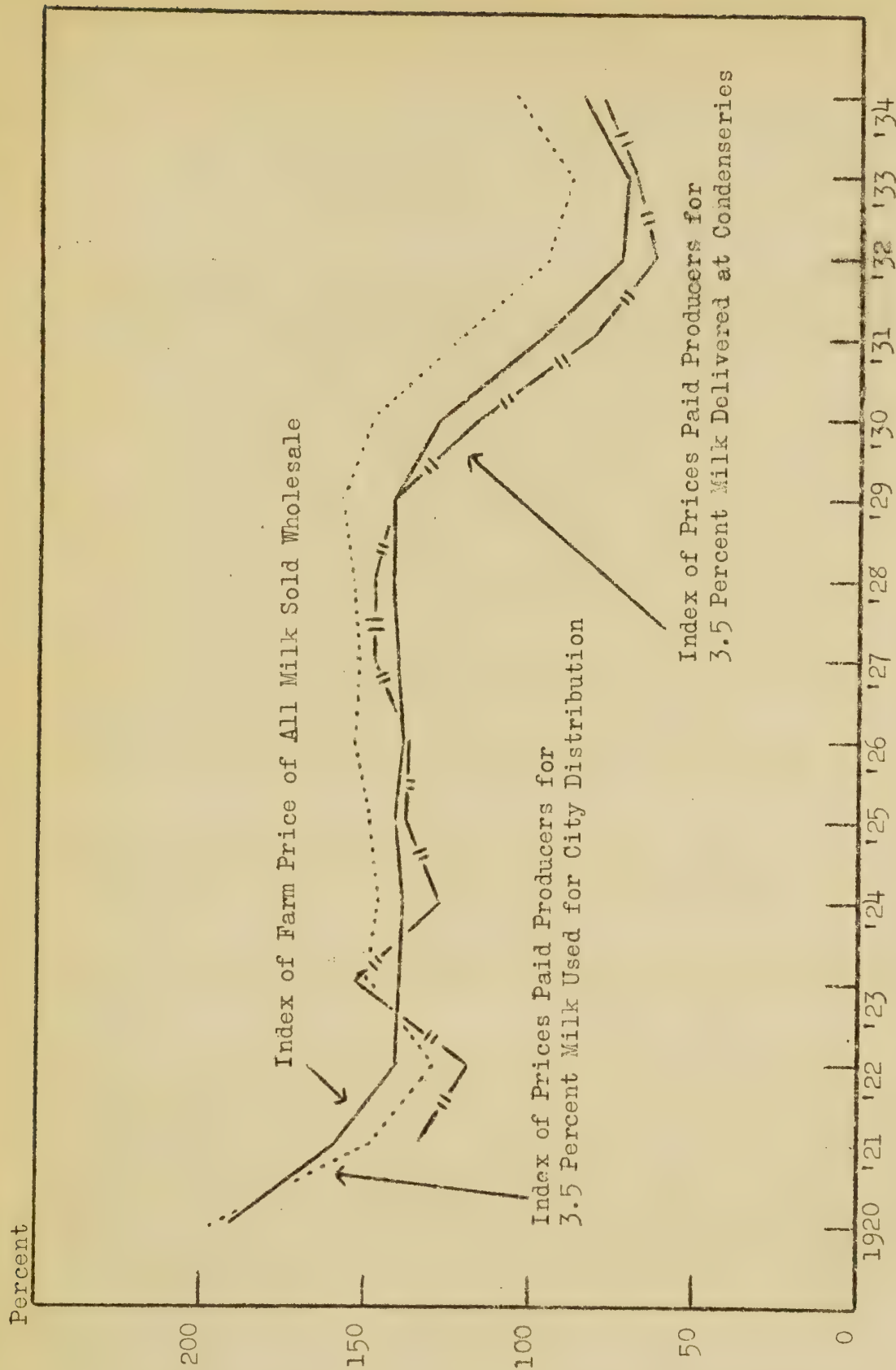


FIGURE 4. - INDEX NUMBERS OF FARM PRICES FOR ALL MILK SOLD WHOLESALE, INDEX NUMBERS OF PRICES PAID TO PRODUCERS FOR 3.5 PERCENT MILK DELIVERED AT CONDENSERIES, AND INDEX NUMBERS OF PRICES PAID BY MILK DEALERS FOR MILK TESTING 3.5 PERCENT BUTTERFAT, USED FOR CITY DISTRIBUTION AS MILK AND CREAM, UNITED STATES, 1920-1934. (1910-1914 = 100)

Part II

THE PRICE STRUCTURE FOR MILK WITHIN A MILK SHED

The terms under which milk is sold vary widely between markets. In some markets, usually small markets located within a surplus area or with few or no sanitation requirements, producers receive the same price f.o.b. the market for all milk, regardless of whether it is used for fluid milk, cream or manufactured dairy products. In other markets, while producers receive the same price for all milk sold, this price is a weighted average price which is computed by adding together the value of milk sold to distributors in accordance with a schedule of the prices for milk used for various products, and dividing the total sum so computed by the total volume of sales to distributors. In still other markets, producers receive two or more different prices for different portions of the milk which they deliver, a weighted average price for that portion of their milk sold as fluid milk and cream, and a lower price on the remainder, which is used in the production of manufactured dairy products. Again, producers may receive one price for that portion of their milk sold as fluid milk, another price for that portion sold as fluid cream, and still another price for that portion which is used in the production of manufactured dairy products such as butter, evaporated milk and cheese.

In this section, the relationships between the prices of milk used for different purposes f.o.b. city, and the farm price structure arising therefrom, are examined in some detail.

A. The price structure; uniform quality requirements - centralized processing.

For purposes of presentation, the price structure is examined in a hypothetical market, wherein factors operating to establish a differentiation in the prices of milk used in the production of different dairy products are assumed to be non-existent. One by one the factors operating to establish such differentiation in the prices of milk used in the production of different dairy products are considered, and thus the analysis of the price structure progresses from that of the highly simplified hypothetical market toward that of the most complex type of market. For purposes of analysis, therefore, it is assumed that:

1. There is a freely competitive market.
2. Local delivery costs and labor are the same for all classes of product.

3. There is no variation in the volume of milk consumed in different forms.
4. All milk, whether sold to consumers as fluid milk or other dairy products, is of uniform quality.
5. All milk is brought to the city in fluid form, there to be processed into the various dairy products.
6. There is no variation in the volume of milk sold per farm from day to day.

Under the conditions noted above, it is obvious that producers would receive the same per unit price for all milk brought to the market since each unit of the supply is interchangeable with every other unit. This would be true regardless of whether the milk were sold to the consumer as fluid milk, fluid cream, or manufactured dairy products.

However, it is well recognized that the butter and other manufactured dairy products equivalent of a unit of milk can be transported long distances at very low cost per product equivalent of a unit of milk as compared to the cost of transporting a unit of milk the same distance, and can be kept in storage for a relatively long period of time without appreciable deterioration in quality. Manufactured dairy products are composed largely of milk solids, or, stated differently, they are composed of one or more of the constituents of milk concentrated to a very much greater degree than in whole milk. Thus it is more economical to produce the finished product, such as butter, cheese, etc., at a distance from the market and transport the finished product to the market, rather than to transport whole milk to the market and there process it into the finished product (unless, of course, the demand for all the products of milk in the market can be satisfied from the volume of milk produced in the area immediately surrounding the market). For example, one hundred pounds of butter contain approximately 80 pounds of butterfat, and one hundred pounds of 3.5 percent milk contain 3.5 pounds of butterfat. Assuming that transportation costs per one hundred pounds of product are equal, the cost of transporting butterfat in the form of butter and in the form of 35 percent cream would be about $1/23$ and $1/10$, respectively, of the cost of transporting butterfat in the form of milk. The reasons given above suffice to explain why manufactured dairy products are produced, in many cases hundreds of miles from the market, and shipped to the market in finished product form rather than being shipped to the market in the form of fluid milk and there processed into the finished product.

B. The price structure; uniform quality requirements - decentralized processing.

For the purpose of considering the manner in which the transportation factor affects the price structure for milk within a milk shed, the preceding assumption that all milk is brought to market, there to be processed into the several milk products, is now dropped and, instead, in addition to the remaining assumptions noted previously, it is assumed that:

1. All the milk which is produced within 100 miles from the market is needed to satisfy the demand for fluid milk.

2. All the milk which is produced in the area between 100 and 150 miles from the market is needed to meet the demand for fluid cream.

3. All the milk which is produced within the area between 150 and 200 miles from the market is needed to meet the demand for evaporated milk.

4. All the milk which is produced within the area between 200 to 400 miles from the market is required to meet the demand for butter.

5. Transportation costs vary in direct proportion to distances at the following rates per unit per mile:

(a) Whole milk - 1 cent per hundredweight.

(b) The cream equivalent of 100 pounds of 3.5 percent milk - 0.2 cent.

(c) The evaporated milk equivalent of 100 pounds of 3.5 percent milk - 0.1 cent.

(d) The butter equivalent of 100 pounds of 3.5 percent milk - .05 cent.

6. The farm value of skim milk exactly equals the cost of separating cream from milk.

7. The f.o.b. city value of the butter equivalent of 3.5 percent milk (it is assumed that the over-run is necessary to cover the manufacturer's margin) is \$1.00.

Under the above assumptions the f.o.b. city prices that must be paid for milk in order to secure the volume necessary to meet the demand for milk, as well as the f.o.b. city prices that must be paid for the cream equivalent and evaporated milk equivalent of 100 pounds of milk to

meet the respective demands, can be readily computed. Thus, with the f.o.b. market price of the butter equivalent of 100 pounds of 3.5 percent milk at \$1.00, the farm price of 100 pounds of milk which is converted to butter at a point 400 miles from the market is \$1.00 less the cost of transporting the butter equivalent of 100 pounds of such milk to the market, or 80 cents ($\$1.00 - (400 \times \$0.0005) = \$.80$). At a point 200 miles from market the farm price of milk used for butter is 90 cents ($\$1.00 - \$.10$ transportation costs = \$.90). If milk is to be used in the production of evaporated milk at a point 200 miles from the market, the farm price of such milk must be 90 cents per hundredweight or else farmers will sell their milk to butter manufacturers rather than manufacturers of evaporated milk. The f.o.b. city price of the evaporated milk equivalent of 100 pounds of 3.5 percent milk will be the farm price of 100 pounds of 3.5 percent milk at a point 200 miles from the market, plus the cost of transporting the evaporated milk equivalent of such milk to the market, or \$1.10 ($\$.90 + \$.20 = \1.10). Similarly, the farm price of milk used to produce cream at a point 150 miles from the city must be equal to the farm price of milk used to produce evaporated milk at that point, else farmers will sell their milk for use in evaporated milk rather than cream, and the f.o.b. city price of the cream equivalent of 3.5 percent milk will be the farm price of such milk at a point 150 miles from the market plus the cost of transporting the cream equivalent of 100 pounds of 3.5 percent milk from that point to the city, or \$1.25 ($\$.95$ farm price at 150 mile-point + $\$.30$ transportation costs to market = \$1.25). Similarly, the f.o.b. city price of 3.5 percent milk will be the farm price of milk used for cream at a point 100 miles from the market plus the cost of transporting fluid milk to the market, or \$2.05 ($\1.05 farm price at 100 mile-point + $\$1.00$ transportation costs to market = \$2.05).

Therefore, under the conditions assumed the prices for milk and milk products f.o.b. city would be as follows:

1. Fluid milk - \$2.05 per hundredweight.
2. The cream equivalent of 100 pounds of 3.5 percent milk - \$1.25.
3. The evaporated milk equivalent of 100 pounds of 3.5 percent milk - \$1.10.
4. The butter equivalent of 100 pounds of 3.5 percent milk - \$1.00 (assumed, but of course a different price f.o.b. the market for the butter equivalent of 100 pounds of 3.5 percent milk would be associated with different prices for the other milk products than those computed above).

Under the conditions assumed it is also obvious that milk would not be shipped to the city to be processed into the several dairy products

(except in case of error or lack of knowledge with respect to the most profitable channel of disposal, which is not possible under the assumptions set forth). Prices in the city would be quoted for milk, cream, evaporated milk and butter. All milk brought to the city would command one price, cream another, etc. Thus, there would be no differentiation in milk prices f.o.b. city.

The farm price for milk at any given point within any particular zone is, of course, equal to the farm price of milk at the outer edge of the zone plus the difference between the cost of shipping milk in the particular form to the market from the outer limit of the zone and the cost of shipping such milk from any given point within the zone. The farm price structure for milk that would obtain under the conditions set forth above is shown in Figure 5.

C. The price structure; varying quality requirements - decentralized processing.

If the assumption that all milk is of uniform quality is discarded, and it is assumed that the quality requirements for milk used in the form of fluid milk and cream are higher than those for milk used in the production of evaporated milk and butter, then the type of market under analysis is somewhat more comparable to the rather complex type of milk market now obtaining in many large urban areas.

Sanitation requirements vary somewhat between milk markets. Usually, the requirements cover such items of sanitation as periodic veterinary examination of cows, cleanliness of cows, cleanliness of dairy barns in addition to specifications with respect to the type of flooring, light, etc., specifications with respect to the type and care of the milk house, cleaning and care of utensils, and rules and regulations pertaining to milking and handling of the milk.

It should be obvious that the sanitation requirements under which milk for fluid milk and cream is produced, which in by far the larger number of cases are more stringent than the sanitation requirements under which milk for manufacturing purposes is produced, operate to increase the cost of producing milk for use as fluid milk and cream relative to the cost of producing milk for manufacturing purposes. Thus, over a period of time, the supply price ^{3/} of a given volume of milk used for fluid milk and cream will be somewhat higher than the supply price of the same volume of milk used for manufacturing purposes, other factors remaining constant. Of course, the difference between the supply prices of milk produced for use in different products in any milk supply area, other factors being the same, will depend upon the differences in the sanitation requirements applicable to milk produced for use in the different products. If it were assumed that sanitation requirements raise

^{3/} The price that must be paid in order that a given volume of milk of the desired quality be forthcoming.

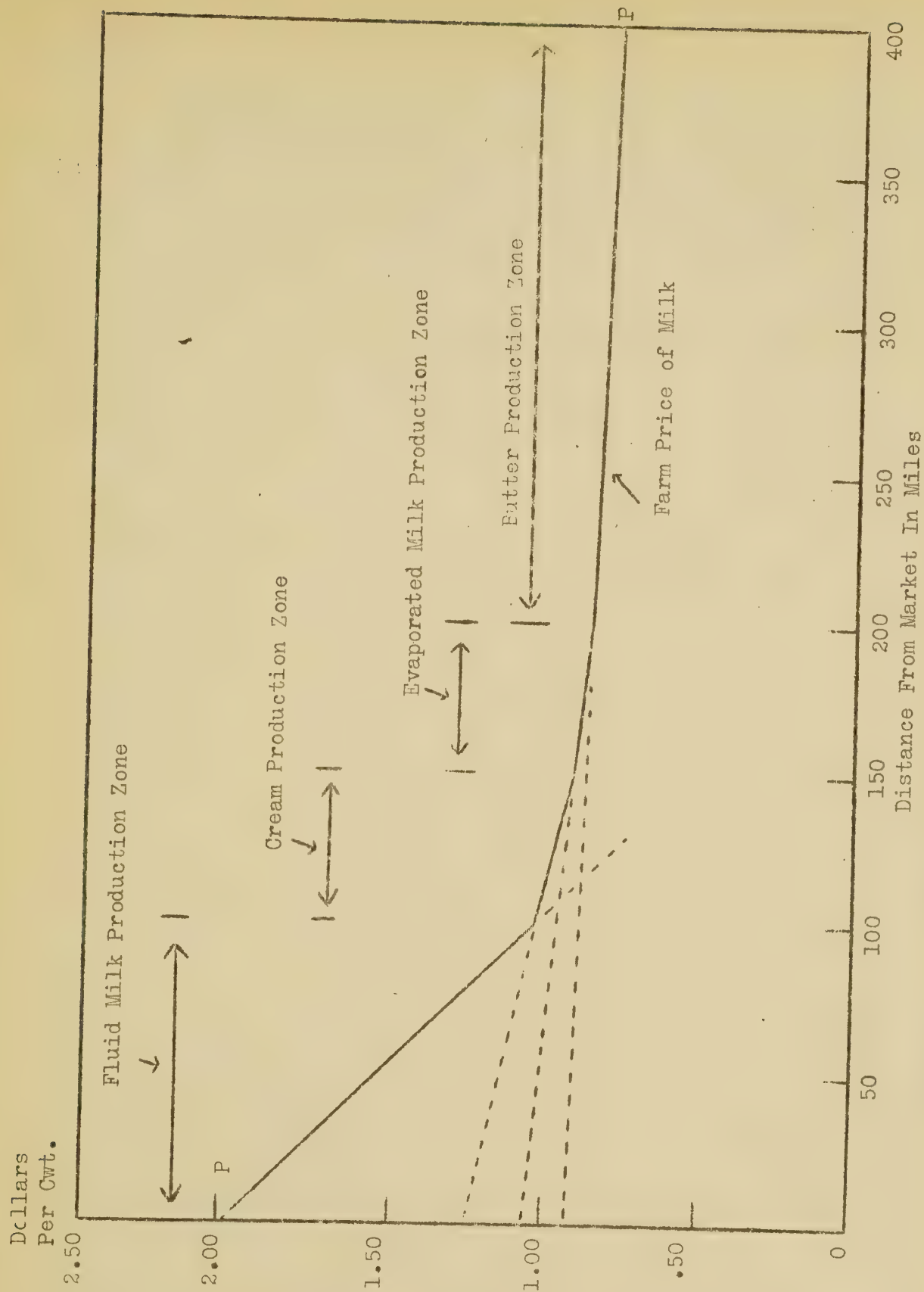


FIGURE 5. - PRODUCTION ZONES AND FARM PRICE STRUCTURE, FOR SPECIFIED DAIRY PRODUCTS AS DETERMINED BY THE TRANSPORTATION RATE STRUCTURE

F.O.B. Market Prices For Specified Product
Equivalent of 100 pounds of 3.5 Percent Milk

the supply price of milk for use as fluid milk and cream 20 cents per hundredweight per farm above the supply price per hundredweight for milk used for manufacturing purposes, the price structure under the assumed conditions would be similar to that set forth in Figure 6 (a position of stable equilibrium is assumed, so that the f.o.b. city prices that prevail, and the farm price structure arising therefrom, are normal supply prices).

Under the conditions assumed, the prices for milk and milk products f.o.b. city would be as follows:

1. Fluid milk - \$2.25 per hundredweight.
2. The cream equivalent of 100 pounds of 3.5 percent milk - \$1.45.
3. The evaporated milk equivalent of 100 pounds of 3.5 percent milk - \$1.10.

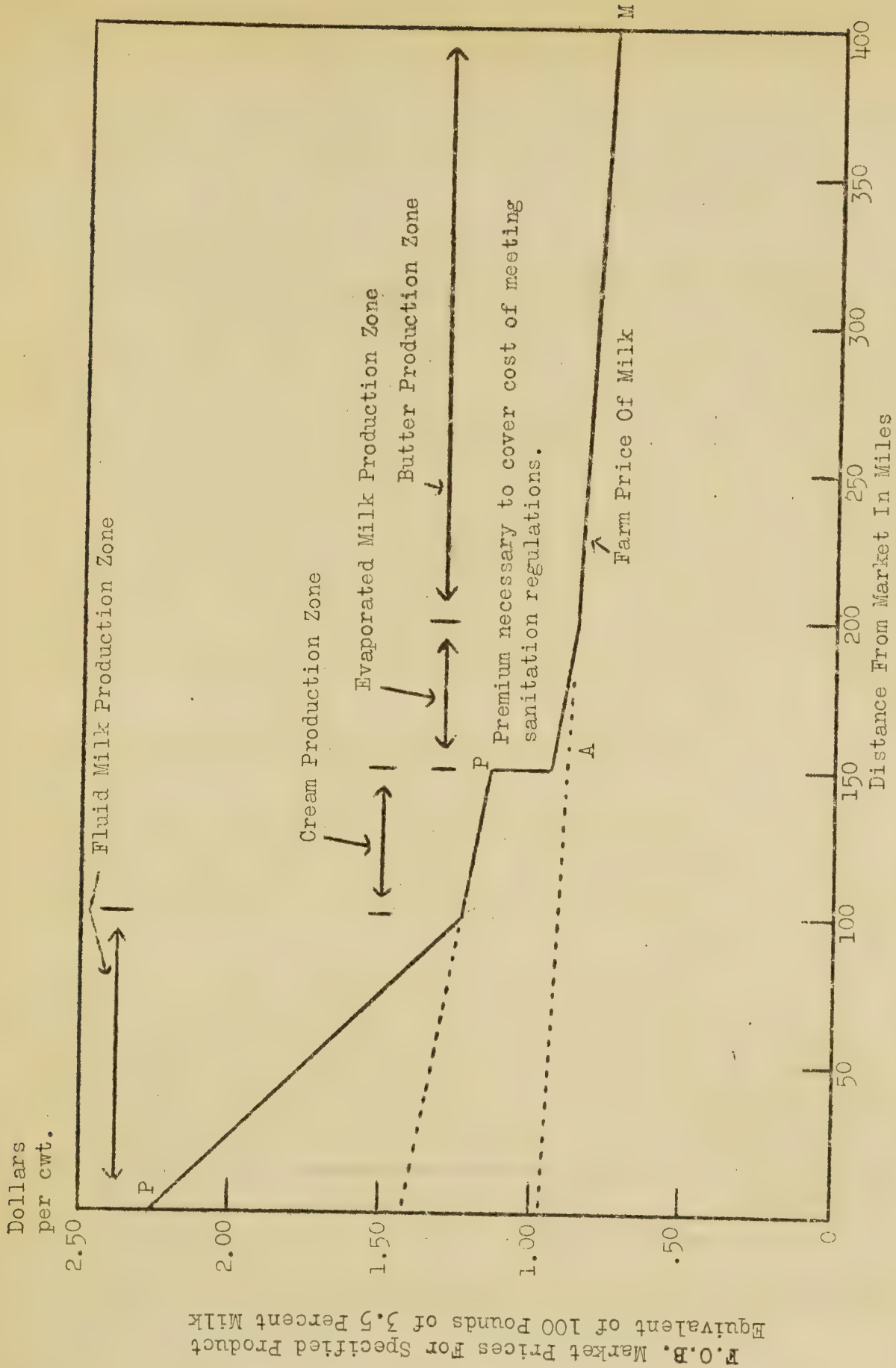


FIGURE 6. - PRODUCTION ZONES AND FARM PRICE STRUCTURE FOR SPECIFIED DAIRY PRODUCTS AS DETERMINED BY THE TRANSPORTATION RATE STRUCTURE AND SANITATION REGULATIONS FOR FLUID MILK AND CREAM.

4. The butter equivalent of 100 pounds of 3.5 percent milk - \$1.00.

In Figure 6, the line PP represents the farm price of milk used for fluid milk and cream; the line AM the farm price for milk used in the production of evaporated milk and butter. It should be noted that as yet no factor has been introduced that will operate to establish different prices for milk f.o.b. the city. Under the assumed conditions, all milk produced within a particular zone will be used in the production of the same product. Thus, no milk will be shipped to the market as milk from the cream zone, etc. Stated differently, there will be no differentiation between the price of milk based on the form in which such milk is sold f.o.b. city. Also, no factor has been introduced that will operate so that individual producers will receive different prices for different portions of their milk. Producers within each zone will sell all of their milk at one price. Farm prices in a particular zone will vary as transportation costs from different points in the zone to the city vary, and will vary between zones because of differences in transportation costs of milk and the product equivalent of milk, and because of differences in cost of producing milk engendered by differences in the sanitation regulations applicable to milk and milk products.

D. The price structure as affected by type of transportation.^{4/}

It should be emphasized that the foregoing treatment of the effects of the transportation rate structure and sanitation requirements on the price structure for milk has been greatly simplified for purposes of presentation. Variations in the transportation rate structure and sanitation regulations from those assumed bring additional complexities into the price structure.

One of the assumptions on which this analysis has been based so far is that transportation rates vary according to distance and weight only. However, several factors influence transportation costs, the more important of which are type of transportation (truck, tank car and railroad), complementary services, topography of country, volume, labor conditions, gasoline and truck costs, and local transportation arrangements. Some attention will be given to the effect of these various factors on the price structure and size of sheds for the different types of dairy products.

^{4/} This section is based largely upon a report prepared by Dr. J. M. Tinley, formerly Principal Agricultural Economist, Dairy Section.

1. Type of Transportation. From points relatively close to a market, producers frequently find it advantageous (or less costly) to transport their own milk to the city. Many producers use small trucks to transport feed, implements, etc., from the city to their farms or from one part of the farm to another and find it convenient to take their milk direct to a city plant. The farmer or a member of his family operates the truck and because of proximity to the city can reduce operating costs per cwt.-mile to a very low figure. However, as distance from the city increases, operation of a small truck per hundredweight milk increases rapidly. A large load becomes more economical so larger trucks are used. Few farmers have sufficient milk to supply a load for a large truck, so either a distributor, a private agency (hauler) or a cooperative association operates a truck and collects milk from several farmers.

After a certain distance varying between, say, ten and sixty miles, depending upon the topography, density of supply, etc., truck transportation becomes too expensive per hundredweight mile. It is expensive to operate a large truck (or truck and trailer) over country roads especially as production often becomes more scattered as distance from a city increases.

Under these conditions, milk is usually hauled by producers or by truck to a centralized country assembling point, cooled and loaded into a tank truck and hauled into the city. Also, there are definite limits to the distance from which milk can be hauled by tank truck. In some of the larger markets, milk is collected at country stations and cooled, and then shipped by train to the consuming center. In a few instances, milk is processed and bottled at a country point and shipped into the city for distribution.

In Figure 7 are shown, hypothetically, the transportation costs on milk into a large consuming center.^{5/} For the first ten miles, milk producers will haul their own milk, the lowest cost being five cents a hundred pounds (most of which is for handling costs). The total cost rises as distance from the consuming center increases, but after about fifteen miles, costs rise very rapidly. There is a zone in which milk may either be handled by the producer or by truck. From about twenty miles, however, it becomes more economical to haul by truck. This is probably true up to about seventy miles. From seventy to ninety miles is another zone of indeterminateness in which milk may be hauled either by truck (in cans) or assembled and hauled in tank truck.

^{5/} The variations here discussed are not considered in later Figures. Therefore, a different set of rates has been assumed, under which the differences in rates have been magnified.

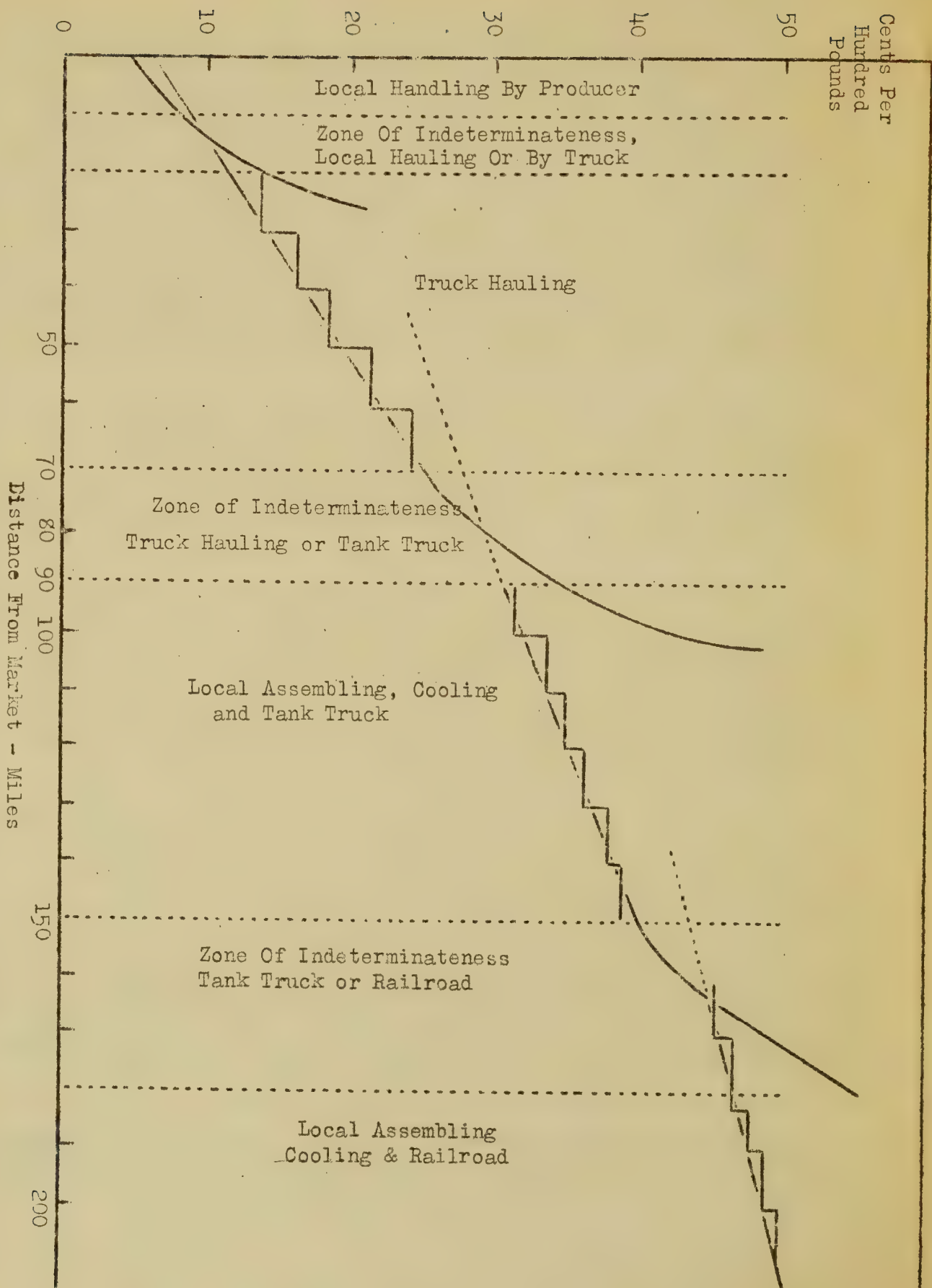


FIGURE 7. - THE INFLUENCE OF TRANSPORTATION RATE STRUCTURE UPON THE PRICE STRUCTURE FOR MILK ^{1/}

^{1/} See text for assumptions on which diagram is based.

From ninety to one hundred and fifty miles, milk will be hauled in tank trucks, but for greater distances the time of hauling and load limitation would tend to make it more economical to assemble milk at a country plant and transport milk to city by train. There is a zone of indeterminateness from 150 to 180 miles in which milk may be hauled either by tank car or by railroad.

These distances would vary from market to market depending upon topography, state of roads, density of supply, relative costs of different methods of transportation, etc.

Transportation rates are commonly set on the basis of zones, under which rates, instead of increasing directly in proportion to distance, increase in a series of steps as is shown in Figure 7.

2. Complementary Services. Transportation rates usually include some elements of cost other than mere hauling. Milk has to be loaded and unloaded, iced or refrigerated. These are usually more or less fixed costs and do not vary with the length of haul. Thus the longer the distance hauled the lower these costs become per mile, resulting in a tendency for transportation rates per unit to decline as distance increases.

There is somewhat greater risk in hauling milk than in hauling butter -- milk has to be handled with more care and speed. For this reason a particular transportation agency may charge a higher rate for hauling an equal volume or weight of fluid milk than for butter or evaporated milk.

3. Rate Schedules. Many transportation agencies, especially railroads, do not arrange their rate schedules by miles, but by zones. It is thus possible that the rate will be the same on milk hauled 101 miles and 120 miles.

4. Topography of Country. Transportation costs per mile are usually somewhat higher in mountainous and hilly country than in flat, level country. This is due to the fact that more fuel is consumed, fuel costs are themselves high, there is more strain on vehicles and speed is greatly reduced. The condition of the roads is also important. Narrow, winding roads greatly reduce the speed of trucks and to a certain extent regulate the type of trucks that can be used.

5. Volume of Milk. Where dairies are small and scattered, the costs of collecting milk are considerably higher than where production is more concentrated. Frequent stops to pick up small quantities of milk and a long distance between stops materially increase hauling costs.

Railroads usually charge different rates, depending upon whether the commodity is hauled in carlot or less than carlot units.

6. Labor Conditions. An important part of hauling costs is the expenditure for truck drivers and mechanics. In cities where labor is cheap, rates may be somewhat lower than where wages are high.

7. Gasoline and Trucks. The prices of gasoline, oil, trucks and spare parts vary considerably in different parts of the country. This may have a material influence on hauling costs in different localities.

8. Control of Hauling. In some markets, all transportation is handled by one agency or by not more than two or three agencies. This reduces overlapping of routes to a minimum and should result in lower unit operating costs. In other markets, each producer or each distributor undertakes to make his own hauling arrangements. In such markets, a great deal of overlapping may occur. Efficient use is not made of transportation facilities, and consequently rates will tend to be higher than where there is centralized control of hauling.

The foregoing serves to indicate some of the factors that affect the transportation rate structure for milk.

E. The price structure as affected by the type of sanitation regulations.

Some of the factors that must be taken into account in determining how sanitation requirements affect the price structure for milk in different milk sheds and for a particular shed are as follows:

(1) The sanitation regulations in force in the milk shed. ~~sanitation~~ regulations are much more stringent in some markets than in others. There is, therefore, no possibility of developing a generally applicable cost figure which could be applied to the price structure for milk within a particular market and used in the practical determination of milk prices within a particular milk shed.

(2) The cost of meeting sanitation regulations, even though the regulations are the same in some markets as in others, may be widely different. Labor and material prices may vary materially between different markets, so that, even though the regulations may be exactly the same between particular markets, the cost of meeting the sanitary regulations may vary materially.

(3) In addition, health and sanitation regulations may be of such nature as to permit only those producers located relatively near the market to qualify as fluid milk producers. For example, the imposition

of a regulation requiring that fluid milk shall be delivered to the consumer within a given number of hours from the time it is produced would automatically set a maximum distance over which milk could be transported and might reduce materially the area from which fluid milk could be shipped to the market. In this case the price for fluid milk would increase until consumption was reduced, or until production within the area was increased, or both, to the point where the market would just use the milk produced within the new zone. This, of course, would increase the price spread between fluid milk and the product equivalent of milk used in other dairy products f.o.b. the market, and would increase the farm prices of fluid milk relative to the farm price of milk used in the production of other dairy products.

Also, sanitation regulations may not increase the costs of meeting the sanitation regulations by the same amount per unit of product on all farms. Some farms are better equipped than others and hence have smaller additional expenditures to meet requirements. Large dairies can ordinarily utilize equipment more economically and, therefore, their cost per unit for milk houses, cooling equipment and other outlays commonly required by health and sanitation regulations is lower. Such dairies have their competitive position improved by the raising of inspection requirements and may increase their production. Others may tend to shift to cream, or butter production, rather than make the additional outlays necessary. Depending upon these effects on supply, zones from which the various products are shipped to the market may be either enlarged or reduced by the imposition of or changes in the sanitation regulations.

While this discussion of the price structure has been developed entirely in terms of transportation costs and costs of meeting health and sanitation requirements, it should be apparent that variations in costs resulting from other causes will work out in practically the same manner. The important distinction is between the effects on the price structure of those costs which vary with distance from market, as does transportation, and costs which are likely to be rather uniform regardless of distance from the city. The influence of each of these types upon the price structure for milk is illustrated in a general manner by this analysis of transportation costs and costs of meeting health and sanitation regulations.

Variations between farms, such as those due to available equipment, type and condition of herds, type of land, labor supply and even personal preferences, will partially determine which farmers will produce milk for the various uses. Also the relative significance of these latter factors becomes greater as class differentials become smaller near the boundaries of zones. Therefore, their principal effect

is to cause the boundaries between the areas in which the several classes are produced to be less clearly defined than would be indicated by the simplified example set forth in the analysis.

(4) Also, there are higher sanitation regulations for fluid milk than for cream in some markets. This operates to establish higher supply-prices for milk produced for use as fluid milk than for milk produced for use as fluid cream.

The foregoing serves to indicate in a general way the manner in which sanitation regulations affect the price structure for milk within a milk shed, and how differences in the sanitation regulations may affect the price structure in different milk sheds.

F. The price structure; decentralized processing - uniform quality requirements - variations in production.

The manner in which the transportation rate structure and sanitation regulations affect the price structure for milk within a milk shed has been set forth in some detail in the preceding pages. In order to approach more nearly the price structure for milk as it actually exists in many milk markets consideration will be given to the price structure under the conditions that prevail when the assumption that there is no variation in production is dropped.

There are marked variations in the production of milk, which are perhaps most easily classified on the basis of time periods, such as day to day, week to week, year to year, and long time variations. There is some day to day variation in production, although this type of variation is undoubtedly negligible. The seasonal variation that takes place in milk production within most milk sheds ^{6/} is marked, production in the fall and winter months usually being much less than production in the spring and summer months. This type of variation is due largely to such factors as (1) the greater supply of succulent feed available during the pasture season, (2) time of freshening of cows, (3) inclement weather during the winter months, etc. In some areas, the seasonal variation in production is much more extreme than in others ^{7/} and even within the same area, production often shows a more marked seasonal variation in some regions than others within the area.

Year to year changes in production are due to such factors as (1) differences in feed production conditions that are associated generally with differences in weather and growing conditions, (2) shifts into and out of the dairy business due to changes in the relative

^{6/} Ross, H. A., Cornell University, Agri. Exp. Station Bulletin No. 527; also based on production data secured with respect to the markets operating under Federal milk licenses.

^{7/} Based on production data secured with respect to the markets operating under Federal milk licenses.

profitableness of milk production as compared to other types of agricultural production, (3) other factors that may operate intermittently, such as the imposition of a sanitary regulation to the effect that all milk sold in the market as fluid milk and cream must come from cows free from tuberculosis, which may operate to cause a marked decrease in the number of milk cows within the area, reduce production within the area quite markedly for a short period, and necessitate a temporary increase in the size of the milk shed.

Cyclical and long-time changes in production are probably associated with long time trends in demand, such as changes in the consuming habits of the people, the ebb and flow of population in urban centers and other factors such as changing opportunity cost relationships and type of farm organization and operation which set the limits of expansion of production within a given area, etc.

Seasonal variation is one of the most important types of variation in production. For purposes of presentation, therefore, the manner in which seasonal variation in production affects the price structure for milk within a milk shed is considered, with all other types of variation in production noted above held constant. ^{8/}

For most milk markets the volume of milk sold to consumers as fluid milk and cream varies somewhat from season to season, but the production of milk varies much more seasonally. Thus, during the period of low production, the production of milk within a milk shed may be just sufficient to meet market requirements (an amount about ten percent in excess of average daily sales), while during the season of flush production the volume of milk produced within the milk shed is usually far in excess of market requirements.

For purposes of presentation, it is assumed that (1) during the period of low production the volume of production within the 100-mile zone (see Figure 5) is equal to market requirements for fluid milk, (2) the sanitation regulations are the same for all milk regardless of the form in which it is sold, (3) production varies seasonally, (4) there is no difference between the seasonal production curves of individual producers, and (5) there are no variations in consumption other than daily. Under these conditions, there are several lines of procedure which distributors might follow with respect to purchasing milk from producers, such as (1) expanding and contracting the area from which milk is secured inversely to the expansion and contraction of milk production, (2) taking all the supply of milk produced within a given area (wherein the supply during the period of low production is just sufficient to meet the market requirements for fluid milk)

8/ For ease in presentation, the examples used to explain certain points are stated in terms of fluid milk only throughout the remainder of this paper. The same treatment is applicable in a general way to other dairy products.

and paying producers prices low enough to enable distributors to secure a high enough margin on fluid milk to cover the losses incurred in handling manufacturing milk during the period when supplies are larger than fluid requirements, or (3) purchasing milk from producers under a price arrangement which encourages producers to produce an even volume of milk throughout the year.

If distributors elected to secure their market requirements for fluid milk by contracting and expanding the area from which they draw their supplies inversely to the seasonal variation in production, refusing to take the production of distant shippers during the season of low production, the zones from which fluid milk would be drawn at different periods of the year would show marked difference from that shown in Figure 5. If, during the period of low production the volume of milk produced in the area within 100 miles of the market were sufficient to meet fluid requirements, the volume of milk produced within this zone would be far in excess of fluid requirements during the period of heavy production. For example, if the volume of milk produced during the peak production period were 40 percent above that produced in the low production period, the milk shed would be markedly contracted, about 40 percent in area if the density of production were constant throughout the area, but more than this if, as is often the case, the density of milk production declines as distance from market increases.

Assuming that the price of milk during the low production period were \$2.05 f.o.b. city, and the farm price structure the same as that indicated in Figure 5, the f.o.b. market price during the period of high production would be less than the f.o.b. market price during the season of low production by an amount equal to the saving in transportation costs involved in securing the supply of milk closer to the market during the flush period, and would vary between these limits during the year, depending upon the extent of the area wherein the volume produced was needed to meet fluid requirements. The farm prices would vary in the same manner, being equal to f.o.b. market prices less the cost of transporting milk to the city.

There are several factors, however, that operate to cause distributors to secure their milk from the same area throughout the year, rather than expanding and contracting the geographical scope of their operations to secure only that milk needed to meet fluid milk requirements. It is a matter of grave concern to the distributor that he be assured of a volume of milk sufficient to meet his market needs. Therefore, the risk involved in dropping a source of supply during the season of flush production, when it is practically certain

that that source will be needed during the season of low production, is a factor operating to check such action, since the distributor can never be certain that some competitor will not immediately furnish the shippers he dropped with an outlet for their milk, thereby forcing him to seek even more distant sources of supply during the season of low production.

Another factor of importance in this connection is that related to the costs of procuring milk from a rather constant area, as compared to the cost of procuring milk from an area that varies markedly throughout the year both in geographical extent, and the number of individual sources of the raw material. It undoubtedly costs less to procure milk from an area that stays rather constant with respect to geographical extent and number of producers, than from an area that varies markedly throughout the year in geographical extent and number of producers. Some of the savings are: (1) there are fewer field men needed to contact producers and secure their patronage, (2) bookkeeping and office expense is lower due to the fewer number of producers for whom accounts must be kept, statements must be prepared, and to whom payments must be made, (3) fewer laboratory tests have to be made, resulting in savings in laboratory technician labor costs, laboratory supplies, etc., (4) fewer individual containers have to be handled, involving savings in receiving labor, can washing, and sampling, and (5) there is less cost involved in furnishing various services to producers. It appears, then, that distributors can afford to pay producers a premium for evenness of production, so that they may, through the payment of such premium, secure the volume of milk needed by them to meet their fluid milk requirements from an area smaller in extent geographically, and in numbers of individual sources of supply, rather than securing their supply from an area that contracts and expands markedly as production decreases and increases seasonally. The amount of the premium distributors can afford to pay in this connection is the difference in the costs of procuring their milk supply from an area that remains practically constant in geographical extent and in number of individual sources of supply, and the cost of procuring milk from an area that varies markedly in geographical extent and the number of producers from whom milk is purchased.

There is another factor that exerts a tendency to cause the distributor to pay producers a premium for evenness in production. It has been pointed out previously that a volume of milk perhaps 10 percent in excess of average daily sales must be brought to market to meet daily variations in the volume of milk sold to consumers as fluid milk. In order to handle this volume of excess milk, which might be termed the daily operating reserve, the distributor has to integrate a by-product

enterprise with the main enterprise, or find some other channel of disposal. However, as far as this operating reserve is concerned, it is of such constant volume^{9/} that efficient methods of disposal as manufactured products can be developed. It is the marked variation in the seasonal excess and the difficulty of handling it efficiently that is an important factor in leading distributors to endeavor to secure a more even volume of supplies. This arises because more efficient methods of handling the excess can be developed when the supply is constant than when it varies markedly. Thus, during the season of flush production the distributor has to convert to other uses, or someone else does it in his stead, a volume of milk that may be several times as great as the volume so converted during the season of low production. This may be demonstrated by reference to some assumed figures, as follows:

1. The volume of milk sold daily as fluid milk throughout the year is 10,000 pounds.

2. The volume of milk brought to market is 11,000 pounds (10 percent of average daily sales needed to meet daily variations in fluid milk sales) in the season of low production and 14,000 pounds during the season of flush production.

The volume of milk that is diverted to uses other than fluid milk is therefore 1,000 pounds per day during the season of low production and is 4,000 pounds per day during the flush period, or 3,000 pounds greater than during the low period. This is entirely a seasonal excess (3,000 pounds of the 4,000) and represents an increase in the output of products other than fluid milk of 300 percent. Of course, under actual conditions, the increase in the volume of milk diverted to uses other than fluid during the flush season will be dependent upon the actual seasonal variation in production, which will, in some cases, be greater, and in other cases less, than indicated in the above example.

The seasonal excess in production therefore raises serious questions as to how it may be handled efficiently. It undoubtedly costs far more to handle a volume of excess milk that fluctuates markedly from season to season, as does a seasonal excess, than it costs to handle a volume of excess milk that remains rather constant from season to season. This is due to the fact that equipment, and in many cases labor, must be available to handle a peak load far in excess of the load during the period of low production when only a small volume of milk, equal to about 10 percent of average daily sales,

^{9/} Assumed, but practically all available data indicate that it is actually quite constant.

is converted to uses other than fluid milk. The distributor, therefore, can afford to pay a premium for evenness of production in addition to that already noted, the size of the premium being approximately equal to the difference in costs involved in handling a constant volume of excess (the operating reserve) as compared to handling a widely fluctuating volume of excess milk (the seasonal excess).

The foregoing indicates that distributors are able to pay a premium for evenness in production. It appears that it would be a matter of indifference to distributors whether they paid a given sum of money, including premiums for evenness of supply, to secure a particular volume of milk, or paid a sum of money about equal to the former for a similar volume of milk, the latter sum, however, being paid partly to producers delivering an uneven volume of milk, and partly for extra costs involved in procuring milk from an irregular area. In the former case, the farmer gets a higher percentage of the total volume of money expended for milk purchases and operating costs by the distributor than in the latter case, but total costs to the distributor remain about the same. It is probable that it is a matter of indifference to distributors whether they pay out a given sum of money in the one manner or the other. If distributors elect to secure their milk supply without paying producers a premium for evenness in production, it is evident that the seasonal variation in producers' prices would be quite marked.

It is, obviously, more economical to secure milk that is to be sold as fluid milk from sources near the market and to process the seasonal excess into milk products other than fluid milk at points outside the area wherein production is just necessary to meet fluid requirements, since the cost of transporting the fluid milk equivalent of manufactured dairy products from any given point is much greater than transporting such products to market in finished form. Of course, the extent of the saving will depend upon the size of the area and the like. Thus, during the period of flush production, fluid milk would be drawn from a point much nearer to market (depending upon the seasonality in production and relative density of production throughout the area) than during the season of low production. F.o.b. market prices for fluid milk during the year would vary directly with differences in costs of transporting milk from different points within the area. Thus, if milk is transported only 50 miles during the flush period and 100 miles during the low period, f.o.b. market prices, assuming transportation costs of 1 cent per hundredweight per mile, would vary within a 50-cent range during the year, being 50 cents higher during the period of low production than in the period of high production. Farm prices would vary in the same manner, being equal to f.o.b. market prices less transportation costs.

If, however, milk is brought to the market in fluid form and is then diverted to more concentrated forms such as cream, evaporated milk and butter, the product equivalent of such milk will sell at prices f.o.b. the market equal to the price at which the product can be shipped to the market from distant areas. Thus, if the butter equivalent of milk can be brought to the market from distant sources for \$1.00 f.o.b. the market (farm price plus transportation costs on the butter equivalent of 100 pounds of milk), the butter equivalent of milk brought to the city in fluid form will sell for only \$1.00 f.o.b. the market. The farm price of such milk would be materially less than \$1.00 per hundredweight. For example, if milk is shipped 50 miles and transportation costs are 1 cent per hundredweight per mile, the cost of transporting a hundredweight of such milk is 50 cents. If the product equivalent of such milk sells for \$1.00 f.o.b. the market, then the farm price of such milk would be 50 cents. Of course, if such milk is shipped any great distance as fluid milk, the product equivalent f.o.b. the market may not sell for enough to more than cover transportation costs from the farm to the market. Therefore, if milk is shipped to the market in fluid form for any appreciable distance and then converted to more concentrated products, farm prices for fluid milk are decreased appreciably. Under these conditions the seasonal variation of prices paid producers would be much more pronounced than that obtaining under the conditions treated previously.

G. The price structure, decentralized processing, special quality requirements for fluid milk - variations in production.

The seasonal variation in prices to producers would be even more marked than under the conditions treated previously if there were higher quality requirements for milk produced for use as fluid milk than for milk produced for use in other products.

This can be demonstrated quite readily by reference to the following example wherein it is assumed that (1) distributors bring to the market only that milk needed to meet their fluid requirements, which are assumed to be constant; (2) the area from which the fluid milk is drawn is contracted and expanded inversely to the seasonal variation in production; (3) distributors contract with producers to take their milk only for the periods wherein it is needed (obviously, under this sort of an arrangement the milk of some producers would be used as fluid milk all of the time while that of others would be so used at only certain specified seasons in the year); (4) the cost

of meeting sanitation requirements, if all milk were sold as fluid milk during the year, would be 20 cents per hundredweight per producer; (5) the alternative farm value of milk sold for any other purpose is \$1.00 per hundredweight; (6) transportation costs vary uniformly with distance, at one cent per hundredweight per mile; (7) during the season when the milk of producers in outlying areas is not needed for fluid milk uses, there are plants available for manufacturing it into other dairy products.

Under these circumstances the total yearly cost of meeting fluid milk requirements for outlying producers, or, rather, for those producers who sell their milk as fluid milk for a short period during the year, would have to be covered in a much higher farm price for the months during which they sell their milk as fluid milk.^{10/} Under these assumptions, a producer selling his milk as fluid milk during the entire year would incur only 20 cents per hundredweight additional expense for meeting sanitation regulations. On the other hand, the producers who sold milk as fluid milk one month of the year would incur equal expenses over the entire year, or approximately twelve times as great per unit for the month during which such milk is sold as fluid milk. Thus, during the season of low production the farm price must be sufficient to cover, during one month, the entire cost of meeting sanitation regulations for the entire year, which, in the assumed case, would amount to approximately \$2.40 per hundredweight above the alternative use value for milk at the farm. The operation of this factor is depicted graphically in Figure 8.

Under these assumptions the f.o.b. city price (farm price plus transportation costs) ranges from \$2.20 per hundredweight during the month of high production to \$4.95 per hundredweight during the month of low production. If, as assumed, distributors purchase a uniform quantity of milk per month, the weighted average price would be approximately \$2.90 per hundredweight. If, however, production within the area within 100 miles of the market (see Figure 8) were uniform from month to month at a level equal to production during the month of high production obtaining in the example set forth above, the f.o.b. market price throughout the year would be \$2.20 per hundredweight as compared to the weighted average price of \$2.90 per hundredweight prevailing under the conditions as set forth in the previous example. If, therefore, the distributor

^{10/} Of course, part of the expenses of producing milk in conformance with the sanitation regulations is fixed, and part of them is variable. This introduces an additional complexity, and probably operates to change the seasonal price curve from that set forth in this analysis. However, it does not appear necessary to develop this point further for the purposes of this paper.

Farm Price Structure - Special Sanitation Requirements for Fluid Milk - Fluid Milk Area Varied Inversely to the Seasonal Variation in Production

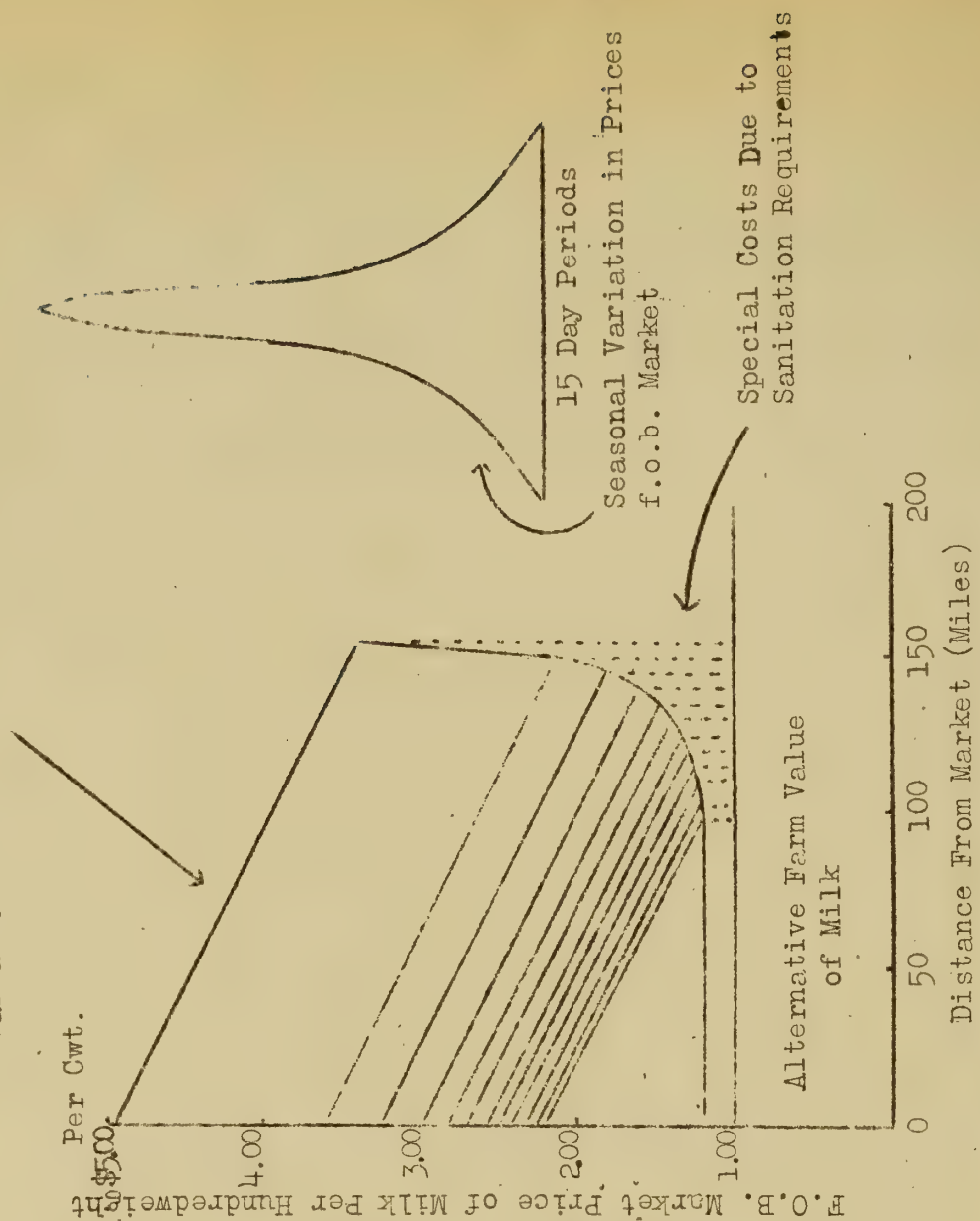
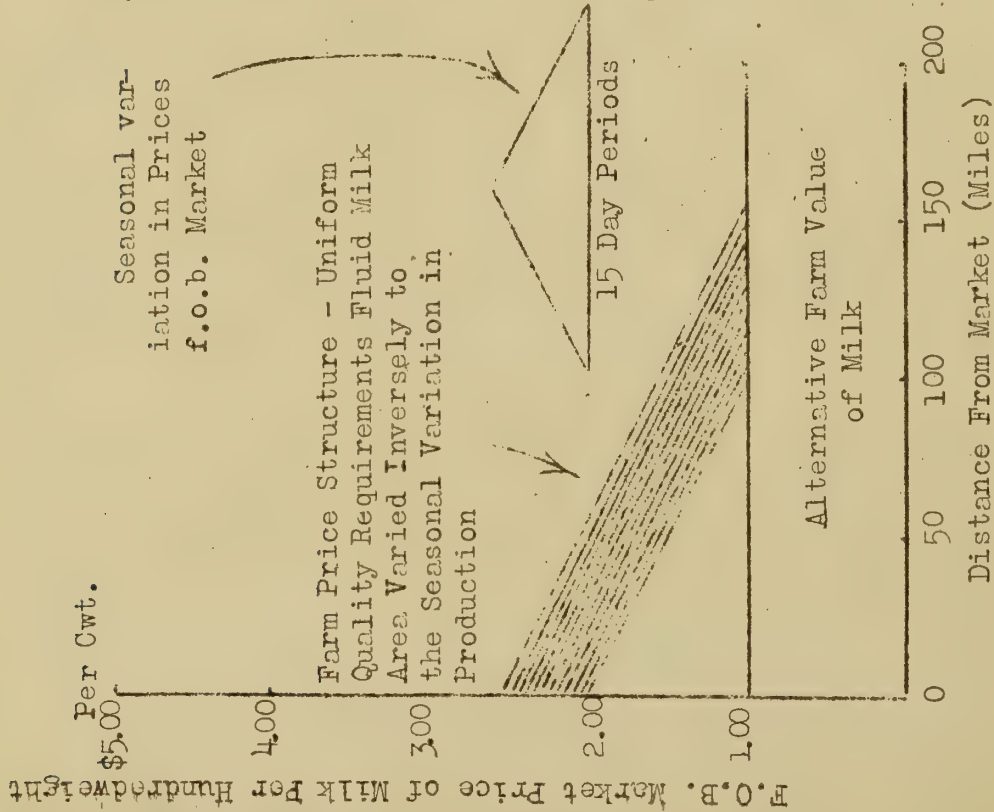


FIGURE 8. - THE PRICE STRUCTURE FOR FLUID MILK WITH DECENTRALIZED PROCESSING, SPECIAL QUALITY REQUIREMENTS FOR FLUID MILK ASSUMED.

could procure his milk supply from producers who produce a constant volume of milk throughout the year, it is to his best interest to do so, since he could secure his milk supply for less total cost than would be the case otherwise. 11/

It should be noted that the marked seasonal variation in prices, which in any particular market would be different from that set forth above, depending upon the degree to which conditions in the market and the supply area vary from those assumed in the example, would in time be partially corrected by producers within the area changing their seasonal output curves in order to sell a larger volume of milk during the period when prices are seasonally high. However, it would be greatly to the advantage of some producers to shift their seasonal output curves, and little if any to others, depending upon the type of farm organization and operation followed by each.

It has already been indicated that distributors can afford to pay producers in such a manner that evenness in production is encouraged, due to the economies in procurement costs in securing milk from an area that is rather constant geographically and in number of individual sources of supply rather than an area that varies markedly in geographical extent and in the number of individual sources of supply. Also, it has been indicated that the economies involved in handling a minimum and rather constant volume of excess milk furnish an incentive for distributors to pay producers in such a manner that evenness in production is encouraged, in addition to the incentive noted above.

Heretofore it has been assumed, for purposes of analysis, that there is no difference between the seasonal production curves of individual producers. This assumption is now discarded and the analysis focused upon conditions more nearly in accordance with those that prevail in actual markets. It is well recognized that there are marked differences between the seasonal production curves of different groups of producers as well as individual producers. 12/ Thus, in any particular milk market there are many producers who produce milk practically in accordance with fluid milk needs, while others do not.

11/ For purposes of presentation and emphasis, this example has been exaggerated.

12/ Lininger, F. F., Pennsylvania State College, Agricultural Experiment Station Bulletin No. 231, also based on unpublished data in the files of the Dairy Section.

A brief consideration of the types of distributors and processors operating within any particular milk shed will now be given in order to bring into the analysis the conditions which, taken in conjunction with those set forth in the two preceding paragraphs and in Part III of this paper, suffice to explain why milk suitable for consumption as fluid milk is brought to market, one part of which sells for one price, another part for another, etc., in short, the development of a system of class prices.

In almost any milk market (except as is the case in those small villages and towns where practically all of the milk is distributed by producers) where the economy of the market has developed to the point that distributors have become specialized, different degrees of specialization obtain between distributors. Some distributors sell only fluid milk and/or cream, others sell only fluid milk and/or cream and a relatively small volume of manufactured by-products (butter, cheese, ice cream, etc.) and still others sell some fluid milk and cream and sell a relatively large volume of manufactured dairy products. Within the same area, other processors produce and sell manufactured dairy products entirely. In other words, all degrees of enterprise combinations are to be found, ranging from the highly specialized fluid milk distributor to the relatively as highly specialized manufacturer of manufactured dairy products. The reason for such specialization is, obviously, that the economies in organization and operation gained through specialization are quite marked. This point needs no further proof than that evident to anyone who observes the present organization and operation of industry, both agricultural and non-agricultural.

Under the above conditions, it may appear that it is to the interest of all fluid milk distributors and all processors of manufactured dairy products within a particular area to pay producers in such a manner that evenness in production is encouraged rather than for specialized fluid milk distributors to do this alone. This is true to a certain extent. However, milk is bulky and perishable and the storage of milk is not economically feasible. On the other hand, manufactured dairy products can be and are stored for relatively long intervals. Thus, manufactured dairy products are produced in largest volume during the spring and summer months and are stored until they are moved into consumption. This tends to even out the seasonal variation in the prices of manufactured dairy products. Under these conditions the premium that could be paid producers of milk for use in manufactured dairy products to encourage evenness in supply would be equal to the cost of storage from the flush production period until the product moves into consumption and the savings realized in manufacturing costs when the volume of product

produced throughout the year is constant rather than varying. In addition, the supply areas of individual manufacturing plants are, in most cases, much smaller than the supply areas of individual fluid milk plants so that transportation costs do not affect farm prices seasonally to as great an extent as is the case with fluid milk. Also, there are, in many cases, few sanitation requirements with respect to the production, care and handling of milk produced for use in the production of manufactured dairy products; and, in those cases where there are sanitation requirements with respect to such milk, they are rarely, if ever, of such nature that farm production costs are increased markedly. Thus, sanitation requirements for milk produced for use in the production of manufactured products do not operate to increase the seasonal variation in the price of such milk to any appreciable degree, certainly, in any case, to a much lesser extent than in the case of milk produced for use as fluid milk. These considerations suffice to explain in a large measure why pricing systems pointed to encouraging evenness in production have not developed with respect to milk produced for use in the production of manufactured dairy products.

In view of the foregoing, it appears that there is a wide range in the incentive of different types of distributors to pay producers in a manner that encourages evenness in production. For specialized fluid milk distributors this incentive is quite strong and diminishes in strength in relation to the diminution in the degree of specialization of distributors until, in the case of manufacturers of manufactured dairy products, there is little incentive to purchase milk from producers for evenness so that evenness in production is encouraged. Under these conditions fluid milk distributors will compete with each other to secure the patronage of those producers who produce a rather constant volume of milk throughout the year so that these producers become associated with specialized fluid milk distributors. Further, producers who produce a more variable volume of milk will become associated with less specialized distributors. Stated in other terms, when producers are classified on the basis of their relative seasonality of production, they will tend to become directly associated with distributors in accordance with the relation between the relative constancy of production of different classes of producers and the relative strength of the incentive of different classes of distributors to secure an even volume of supply of the raw material. Thus, within a milk shed different producers will receive different prices for milk, such differences, after adjustments for location differences, being due to relative differences in the seasonal variation of production of different producers. Under these circumstances and providing economic forces have time to work out their full effects, producers who produce a relatively constant volume of milk throughout the year will receive

higher prices than those producers who produce a relatively more variable volume of milk throughout the year. Furthermore, the producers who produce a relatively constant volume of milk throughout the year will tend to be associated with highly specialized fluid milk distributors (highly specialized in the sense that the operating unit is engaged almost entirely in the distribution of fluid milk), while those who produce a relatively more variable quantity will be associated with distributors who are less highly specialized (in the sense noted above).

Heretofore, no seasonal variation in consumption of fluid milk has been assumed. The next step in the analysis is to examine how (1) various factors operate to establish retail prices for fluid milk at a practically uniform level throughout the year and, with small seasonal variation in demand, lead to the development of the seasonal excess, and (2) the manner in which the bargaining arrangements between producers and distributors affect the price structure for milk within a milk shed.

PART III

The Utilization of Milk in a Market as Influenced by the Nature of the Demand for Milk.

Heretofore the analysis has been developed on the assumption that there were no variations in the amount of milk sold as fluid milk in the market from day to day and season to season, hence, granting seasonal variation in production, it followed that, during the period of the year when production exceeded consumption, a portion of the milk produced for use as fluid milk in a particular area had to be diverted to uses other than fluid milk. This assumption is now dropped, and the analysis is focussed upon the determination of (1) whether there are variations in the volume of milk sold in the market from day to day and season to season, (2) the factors that account for such variations, if any, and (3) whether such variations are or normally may be expected to be of sufficient amplitude to keep the total volume of milk sold as fluid milk in the market equal to the volume of milk produced for use as fluid milk in the area supplying the market. A solution of the problems noted above is to be found largely in a consideration of the nature of the demand for fluid milk and the manner in which milk is distributed to consumers.

When considered in light of the usual supply and demand analysis of the factors affecting the price of any particular commodity, it might be expected that retail milk prices to consumers would be adjusted or changed from day to day and week to week as changes took place in the supply and demand situation. Stated differently, if, on a particular day of the week or during any particular week, milk supplies increased or decreased, it might be expected that retail milk prices (assuming no change in demand) would vary inversely to the changes in supplies, especially in view of the fact that milk is a highly perishable product and cannot be stored advantageously.

As far as actual supply and demand conditions are concerned, there are relatively large day to day variations in demand ^{13/} and relatively small day to day variations in supply. Under these circumstances, it might appear that there would be marked variation in the retail price of milk from day to day. However, it is probable that this pricing procedure would necessitate a type of market organization or mechanism whereby buyers and sellers would meet, or through which buyers' day to day demand schedules and sellers' day to day schedules of reservation prices would

^{13/} This point is developed in more detail later.

be made known and would operate to adjust prices in accordance with the day to day supply and demand situation. This type of market organization or mechanism would be somewhat analogous to the present produce exchanges. However, such procedure would be markedly different from the present procedure through which day to day retail prices not only of milk but of many other products are established.

Milk is generally distributed to consumers early in the morning, and numerous milk routes are necessary in order that customers be reached. A driver on a milk wagon cannot ascertain what the demand for milk will be on his route until he has completed deliveries. Thus, as a practical matter, it is impossible for him to adjust his prices in accordance with the demand situation as he finds it. The same considerations apply to the distributive enterprise as a whole. If the demand schedules of consumers on each milk route, and the aggregate demand schedules of consumers purchasing from each distributor and for the market as a whole, were known and accurately predictable from day to day, then the dealer could (in theory) quote prices each day on the basis of day to day changes in the day to day supply and demand situation. As a practical matter this procedure would be extremely unworkable. The highly technical nature of the analysis that would be necessary if such procedure were to be followed, the cost of such precise analysis (which would probably have to be detailed enough to allow the determination and forecasting of the demand schedules on many, if not all, milk routes), and the partially indeterminate nature of the results secured would preclude following the procedure outlined. The only practical procedure is for the distributor to quote prices for a longer period of time, rather than to quote prices daily. This is the procedure distributors actually follow and, under these circumstances, day to day variations in the demand for fluid milk (day to day variation in supplies ^{14/} are negligible) are manifest in variations in day to day purchases by consumers at a constant price, rather than being manifest in day to day variations in price.

It may appear, when weekly and monthly periods are considered, that retail prices would change in response to weekly and monthly changes in the supply and demand situation. However, retail prices remain constant for relatively long periods. (See Table 1.) The reasons for retail prices remaining constant for relatively long periods of time, rather than being reduced so that the seasonal increase in the volume of milk produced for use as fluid milk which takes place during the summer months in most milk market supply areas is moved into consumption as fluid milk, will now be examined. The explanation of practically constant retail prices of fluid milk is to be found mainly in the nature of consumer's response to changes in prices and, arising mainly therefrom, the sales and price policy followed by distributors.

^{14/} This is not to say that supplies do not change from day to day, since there is a trend in daily supplies that is seasonal in character. However, this trend is small when considered on a

Table 2. Number of periods during which retail price of milk remained unchanged for a year or more in principal milk markets.

Market	Period during which price remained unchanged:				Period : years covered	:Percentage which the period during which price remained constant for a year or more is of total months in entire period
	13-24 : months	25-36 : months	37-48 : months	Over 48 : months		
New York	1	2		1	1909-31	40.4
Boston		1			1907-31	11.3
Philadelphia	1	2		1	1907-31	67.7
Chicago	1		1	2	1907-31	71.7
Baltimore	5	1		1	1909-33	61.3
Washington	4	1			1909-31	31.2
Minneapolis	4	1			1909-30	35.2
St. Paul	2	1			1914-31	28.2
St. Louis	1	1		1	1909-31	52.2
Atlanta	5		1		1907-31	40.3
Omaha	3				1909-31	22.1
Denver	2	1		1	1909-31	41.7
Los Angeles	5		1	1	1909-31	64.9

Based on data secured from reports of the Bureau of Labor Statistics, United States Department of Labor.

Statistical investigations have in general indicated that the demand for fluid milk by consumers is very inelastic; that is, that the change in the quantities of milk taken, following increases or decreases in price, is relatively very small. Two published studies ^{15/} for the Chicago and New York markets indicate that, during the period covered by the studies, when consumers recognized the necessity for changes in the retail price of milk, a one cent change in the retail price of milk per quart had a very slight immediate effect on sales and this effect was considerably diminished after five or six weeks.

Evidence relative to the influence of price changes upon milk sales has been obtained from an examination of the milk sales by distributors purchasing from cooperative associations in Baltimore, Maryland, Boston, Massachusetts, and the Twin Cities, Minnesota. In these cities the cooperative associations have a considerable share of the business of the market and changes in their sales are no doubt representative of the market as a whole. These data were analyzed by comparing the sales in the calendar month preceding the price change with the sales in the calendar month following the price change, ^{16/} after adjusting for the influence of the average seasonal variation in sales. Indexes of seasonal variation were calculated by the median-link~~-~~ relative method, omitting the months in which price changes occurred. The compared months have been adjusted by dividing each by its corresponding seasonal index. The results of the analysis are given in Tables 2 to 4.

Examination of the data shows that usually a change in price results in an opposite but much smaller change in sales. In Boston, there were fifteen price changes (eight decreases and seven increases) during the period March 1922 to September 1931; in Baltimore there were only two changes, one decrease and one increase; and in the Twin Cities market there were seven decreases and three increases. Changes in sales in Boston were directly associated with changes in prices in four cases instead of being inversely associated as would be the case if other conditions remained the same. These four exceptions followed price changes occurring in July 1927, April 1928, July 1929 and August 1931; and there were four exceptions in the Twin Cities market in March 1926, November 1927, January 1931 and March 1932.

^{15/} Ross, H. A. The Marketing of Milk in the Chicago Dairy District. Ill. Agr. Exp. Sta. Bull. 269, pp. 503-510, 1925.
Ross, H. A. Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York. U. S. Dept. of Agr. Tech. Bull. 73, pp. 44-47, 1928.

^{16/} In some cases prices changed each month for two or more consecutive months. In these cases, the sales in the calendar month preceding the price change were compared to the calendar month following the last month in the series of consecutive monthly price changes.

Table 3. Changes in sales of fluid milk following changes in retail prices, Baltimore, Maryland, September 1926 to May 1931, inclusive.

Month	Sales (30-day month basis) <u>1/</u>	Index of seasonal varia- tion <u>2/</u>	Seasonally adjusted sales <u>3/</u>	Retail prices per quart <u>4/</u>
	: 1,000 gallons:	: Percent	: 1,000 gals:	: Cents
September 1926	: 1,544	: 100.5	: 1,536	: 13
November 1926	: 1,510	: 101.0	: 1,495	: 14
Percent change	:	:	: -2.7	: +7.7
March 1931	: 1,431	: 100.2	: 1,428	: 14
May 1931	: 1,462	: 101.4	: 1,442	: 12
Percent change	:	:	: +1.0	: -14.3
Absolute aver- age percent change <u>5/</u>	:	:	: 1.8	: 11.0

1/ Table 18 Appendix.

2/ Table 17 Appendix.

3/ Computed from Columns 1 and 2.

4/ Table 19 Appendix.

5/ Represents average of percentage changes without regard to signs.

Table 4. Changes in sales of fluid milk following changes in retail prices, Boston, Massachusetts, March 1922 to September 1931.

Month	Sales (30-day month basis) ^{1/}	Index of seasonal variation ^{2/}	Seasonally adjusted sales ^{3/}	Retail prices, per quart ^{4/}
	Mill. lbs.	Percent	Mill. lbs.	Cents
March 1922	22.0	98.6	22.3	13.5
May 1922	22.8	99.5	22.9	12.5
Percent change			+2.7	- 7.4
June 1922	23.9	102.8	23.2	12.5
August 1922	22.9	103.1	22.2	13.5
Percent change			-4.3	+ 8.0
March 1923	23.0	98.6	23.3	14.5
May 1923	23.6	99.5	23.7	13.5
Percent change			+1.7	- 6.9
June 1923	25.6	102.8	24.9	13.5
September 1923	23.2	100.5	23.1	14.5
Percent change			-7.2	+ 7.4
October 1923	23.6	100.4	23.5	14.5
May 1924	25.2	99.5	25.3	12
Percent change			+7.7	-17.2
June 1924	26.2	102.8	25.5	12
October 1924	24.1	100.4	24.0	14.5
Percent change			-5.9	+20.8
February 1925	24.6	97.6	25.2	14.5
April 1925	25.2	97.2	25.9	13.5
Percent change			+2.8	- 6.9
April 1925	25.2	97.2	25.9	13.5
June 1925	28.0	102.8	27.2	13
Percent change			+5.0	- 3.7
June 1925	28.0	102.8	27.2	13
September 1925	25.7	100.5	25.6	14.5
Percent change			-5.9	+11.5

Table 4. (Continued)

Month	Sales (30-day month basis) <u>1/</u>	Index of seasonal variation <u>2/</u>	Seasonally adjusted sales <u>3/</u>	Retail prices, per quart <u>4/</u>
	Mill. lbs.	Percent	Mill. lbs.	Cents
October 1926	28.4	100.4	28.3	14.5
February 1927	27.8	97.6	28.5	14
Percent change			+0.7	- 3.4
June 1927	29.0	102.8	28.2	14
March 1928	29.5	98.6	29.9	15.5
Percent change			+6.0	+10.7
March 1928	29.5	98.6	29.9	15.5
May 1928	29.5	99.5	29.6	14.5
Percent change			-1.0	- 6.5
June 1928	29.9	102.8	29.1	14.5
September 1928	29.4	100.5	29.3	15.5
Percent change			+0.7	+ 6.9
November 1930	29.1	100.7	28.9	15.5
March 1931	30.2	98.6	30.6	12.5
Percent change			+5.9	-19.4
July 1931	31.6	106.8	29.6	12.5
September 1931	30.1	100.5	30.0	13.5
Percent change			+1.3	+ 8.0
Average percent- age change <u>5/</u>			-5.8	+11.9
Average percent- age change <u>6/</u>			+3.8	- 9.3
Absolute average percentage change <u>7/</u>			4.5	10.2

1/ Table 20 Appendix.

2/ Table 17 Appendix.

3/ Computed from 1/ and 2/.

4/ Table 21 Appendix.

5/ Represents average of percentage increases in price that were associated with percentage decreases in sales.

6/ Represents average of percentage decreases in price that were associated with percentage increases in sales.

7/ Represents average of percentage changes in price or in sales, without regard to signs, that were associated with opposite changes in sales or in price.

Table 5. Changes in sales of fluid milk following changes in retail prices, Twin Cities, Minnesota, March 1924 to August 1932.

Month and year	Sales 30-day-month basis ^{1/}	Index of seasonal variation ^{2/}	Seasonally adjusted sales ^{3/}	Retail prices per quart ^{4/}
	Thousand pounds	Percent	Thousand pounds	Cents
March, 1924	11,279	101.4	11,123	11.5
May, 1924	11,720	99.5	11,779	10
Percent change			+ 5.9	- 13.0
July, 1924	11,871	98.0	12,113	10
September, 1924	11,788	100.1	11,776	11
Percent change			- 2.8	+ 10.0
August, 1925	12,570	99.1	12,684	11
October, 1925	12,492	102.5	12,187	12
Percent change			- 3.9	+ 9.1
December, 1925	11,861	98.0	12,103	12
March, 1926	12,246	101.4	12,077	11
Percent change			- 0.2	- 8.3
August, 1927	12,111	99.1	12,221	11
November, 1927	12,608	101.7	12,397	12
Percent change			+ 1.4	+ 9.1
December, 1929	12,980	98.0	13,245	12
February, 1930	13,571	101.0	13,437	11
Percent change			+ 1.4	- 8.3
October, 1930	13,543	102.5	13,213	11
January, 1931	12,961	98.8	13,118	10
Percent change			- 0.7	- 9.1
November, 1931	12,724	101.7	12,511	10
January, 1932	12,203	98.8	12,351	9.5
Percent change			- 1.3	- 5.0
January, 1932	12,203	98.8	12,351	9.5
March, 1932	12,543	101.4	12,361	8.5
Percent change			+ 0.1	- 10.5
June, 1932	12,534	98.1	12,777	8.5
August, 1932	12,717	99.1	12,832	8
Percent change			+ 0.4	- 6.3
Average percentage change ^{5/}			- 3.3	+ 9.6
Average percentage change ^{6/}			+ 2.0	- 9.5
Absolute average percentage change ^{7/}			2.4	9.5

^{1/} Table 22, Appendix.

^{2/} Table 17, Appendix.

^{3/} Computed from columns 1 and 2.

^{4/} Table 23, Appendix.

^{5/} Represents average of percentage increases in price that were associated with percentage decreases in sales.

These unusual cases occur in periods when business conditions were changing rapidly and appear to be adequately explained by changes in these conditions.

Data contained in the reports of the Market Administrators for the various markets operating under Federal licenses also provide some indication of the consumer response to price changes in these markets. Only those markets where Class I milk was defined as whole milk, sold or distributed for consumption as whole milk, and where the size of the sales area has remained constant are considered. These data have been received for such a short period that it was impossible to compute a satisfactory index of seasonal variation and adjust sales for seasonal variation, except where other sales data from the same market were available for earlier periods.

The results of this latter study must be interpreted with some caution since there are other factors than price which influence sales. Sudden changes in temperature influence the volume of milk sold. There is a seasonal variation in total fluid sales, which is in part influenced by the vacation movement, and this in turn is affected by the prosperity of the community. Moreover, in a period of several months in recent years business conditions and consumer incomes have changed materially. These considerations limit somewhat the significance of the results of the study. It is important to note, however, that the results supplement the results obtained in the other studies, showing that changes in price are associated with changes in fluid milk sales, and that the changes in prices are relatively much greater than the changes in sales. The data are shown in Table 5 and indicate that an average change of 3.4 percent in sales is associated with an average opposite change of 12.3 percent in price.

It appears from the foregoing that the demand for milk is highly inelastic, especially when retail price changes are relatively small. When price changes are relatively large, it is probable that the change in consumption may be somewhat greater than when the changes in the retail price are relatively small, although the change in sales is probably less than directly proportional to the change in price, although the data that are available relative to this point are inconclusive. ^{17/} Stated differently, while the demand for milk is less inelastic when large, rather than small, price changes are considered, the coefficient of elasticity of demand still appears to be considerably less than unity.

^{17/} See also Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, Technical Bulletin No. 73, U. S. Department of Agriculture.

Table 6. Summary of changes in sales and in prices
in specified cities.

Sales area and period	: Estimated aver- age daily Class I sales	: Retail delivery price, per quart
	: Pounds	: Cents
Boston:		
April 1934 to September 1934	: 1,618,000	: 11
October 1934 to February 1935	: 1,592,000	: 12
Percentage change	: - 1.6	: + 9.1
March 1935 and April 1935	: 1,576,000	: 13
Percentage change	: - 1.0	: + 8.3
Detroit:		
April 1934 to June 1934	: 1,221,000 ^{1/}	: 10
July 1934 to February 1935	: 1,167,000 ^{1/}	: 11
Percentage change	: - 4.4	: +10.0
March 1935	: 1,153,000 ^{1/}	: 12
Percentage change	: - 1.2	: + 9.1
Evansville:		
May 1934 to September 1934	: 43,764	: 9
October 1934 to March 1935	: 41,635	: 9.5
Percentage change	: - 4.9	: + 5.6
Grand Rapids:		
August 1934 and September 1934	: 127,123	: 9
October 1934 to March 1934	: 127,208	: 10
Percentage change	: 0.0	: +11.1
Kalamazoo:		
July 1934 to November 1934	: 36,733	: 10
December 1934 to February 1935	: 40,720	: 8
Percentage change	: +10.9	: -20.0
March 1935	: 39,397	: 10
Percentage change	: - 3.2	: +25.0
Absolute average percentage change ^{2/}	: 3.4	: 12.3

Tables 24 to 28, inclusive, Appendix.

^{1/} Adjusted for seasonal variation.

^{2/} Represents average of percentage changes without regard to signs.

On the basis of the foregoing, it appears that it would require a very marked decrease in price in order that any appreciable seasonal increase in the volume of milk produced for use as fluid milk be moved into consumption as fluid milk in the market as a whole. It is rather generally recognized that changes in the prices received by producers that are associated with changes in retail prices are relatively greater than the changes in retail prices. This is due to the fact that some of the more important elements in the gross margin between the price received by producers and the price at which the milk is sold at retail (transportation costs, country station charges and the like) do not change with changes in volume; in other words, they are fixed charges per unit. This being the case, the seasonal variation in prices received by producers would be relatively greater than the seasonal variation in retail prices, which, as was pointed out before, would have to be quite marked in order that any appreciable seasonal increase in the production of milk produced for use as fluid milk within the supply area be consumed as fluid milk. Over a period of time, the market seasonal variation in prices received by producers would tend to be reduced, since producers would change the seasonality of their production in order to sell a larger volume of milk at the time of year when prices were seasonally high, and would reduce their sales during the period when prices were seasonally low. However, it would be greatly to the advantage of some producers to change the seasonality of their production and little, if any, to others, depending upon the type of farm organization and operation followed by each. Thus, given time for economic forces to work out their full effects, the seasonal variation in supplies and prices received by producers, and consequently the seasonal variation in retail prices, would be much less marked than would appear to be the case at first.

The second limitation to lowering prices on the basis of the seasonal increase in the volume of milk produced for use as fluid milk by any dealer is that, in order to hold the new customers later when supplies in the market are short, dealers would have to develop new sources of supply during the short season in order to have sufficient milk to meet the requirements of their larger business. These new sources involve an expense in development (see Part II, Section G) and may also have an equal or greater seasonal variation in production the following year. The alternative is to raise prices when supplies are short and thereby reduce the customer's takings or to fail to serve the added customer. Either of these latter procedures is sure to lead to dissatisfaction.

The foregoing facts and considerations suffice to explain in large part why retail prices of fluid milk tend to remain practically constant on a seasonal basis. Thus, instead of retail prices showing marked seasonal variation of such magnitude that the seasonal changes in volume of milk produced for use as fluid milk be moved into consumption as fluid milk, retail prices remain practically constant seasonally and seasonal changes in demand are reflected in greater or less takings of fluid milk, as the case may be, at the ruling level of prices. Such seasonal variations in demand are generally quite small, and are much less than the seasonal variation in the volume of milk produced for use as fluid milk that obtains in most milk market supply areas. (See Table 17, Appendix.) ^{18/} Thus, unless the volume of milk produced for use as fluid milk is equal to fluid milk requirements on a seasonal basis, the seasonal increase in the volume of milk produced for use as fluid milk is diverted to uses other than fluid milk. Stated differently, the seasonal increase in the volume of milk produced for use as fluid milk becomes a seasonal excess over fluid milk requirements. In the next part of the analysis of the price structure for milk within a milk shed, an explanation of the development of class prices, or the classified price plan of payment for milk by distributors, will be set forth.

^{18/} See also Ross, H. A., The Marketing of Milk in the Chicago Dairy District, Ill. Agr. Exp. Sta. Bull. No. 269, and Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, U. S. Dept. of Agr. Tech. Bull. No. 73.

Part IV.

The Price Structure for Milk within a Milk Shed -
The Development of Class Prices.

The analysis of the price structure for milk within a milk shed will now be focussed upon the manner in which class prices or, stated more precisely, the classified price plan of selling milk to distributors, develops in a milk market. At this point it is important to set forth as clearly as is possible in a short paper the difference between the classified price plan and the rating plan.^{19/} The classified price plan is a method of selling milk to distributors, while the rating plan is a method of prorating to producers the proceeds of sales to distributors. The classified price plan does not necessarily need to be complemented by the operation of a rating plan, and classified price plans are often used where no rating plan is in operation. On the other hand, the rating plan under certain forms of administration becomes in effect a classified price plan and a plan for prorating to producers the proceeds of sales to distributors. For example, in some markets, producers associations bargain for "base" and "surplus" prices; "bases" are established for individual producers for which "base" milk producers receive "basic" prices. Producers are shifted among distributors in such fashion that the total bases of producers delivering milk to any particular distributor are approximately equal to such distributor's sales of fluid milk. However, pricing milk to distributors in accordance with a classified price plan is usually more precise than that just noted, with a more strict accounting and pricing of milk according to use, and is not necessarily operated in conjunction with a base-rating plan.

For the purposes of this paper, the classified price plan is defined as a method of selling and pricing milk to distributors in accordance with the use made thereof, while the base-rating plan is defined as a method of prorating to producers the proceeds of sales to distributors.

It has already been demonstrated (see Part II) that, assuming little seasonal variation in the demand for milk, certain supply characteristics operate so that, given differences in individual producers' seasonal output curves, and providing that economic forces have time to work out their full effects, producers who produce a relatively constant volume of milk throughout the year will receive higher prices, other factors accounted for, than producers who produce a relatively more variable volume of milk throughout the year. Furthermore, the producers who produce a relatively constant volume of milk throughout the year will tend to become associated with highly specialized fluid milk distributors (highly specialized in the sense that the operating unit is engaged almost entirely in the distribution of fluid milk, while those who produce a relatively more variable quantity throughout the year will tend to

^{19/} Often called base-surplus, base-rating, and the like.

become associated with distributors who are less highly specialized (in the sense noted above). The assumption that there is little seasonal variation in the demand for milk was then examined, (Part III) and it was found that certain factors operate so that there is marked seasonal uniformity in retail fluid milk prices, and seasonal changes in demand, which are very small in most cases, are reflected in slight seasonal changes in the quantities of fluid milk consumed at practically constant prices, rather than seasonal changes in the quantities of milk consumed that are associated with seasonal changes in retail fluid milk prices. It is in the analysis of the seasonal behavior of retail fluid milk prices, and the effects such behavior would tend to have upon the prices received by producers, that the reasons for the development of the seasonal excess were ascertained.

Once the development of the seasonal excess has been demonstrated, the basis for the effort on the part of specialized fluid milk distributors to secure a uniform volume of milk throughout the year becomes apparent. Under these circumstances, the argument that specialized fluid milk distributors tend to secure milk to meet the needs of their fluid milk trade, which are practically constant seasonally, from producers who produce a relatively uniform volume of milk throughout the year, such producers receiving higher prices, other factors accounted for, than producers who produce a relatively more variable volume of milk throughout the year and, consequently, tend to become associated with less highly specialized distributors, applies with especial force.

It should be noted that it is not contended that distributors select producers who produce a relatively uniform volume of milk throughout the year at random throughout the milk shed. It is rather well recognized that, generally speaking, producers within a particular type of farming area have markedly similar seasonal output curves. Thus, a distributor who wishes to secure a uniform supply of milk throughout the year can usually operate in an area or areas where a fairly large supply of such milk is available.

The situation treated above with respect to the procurement of milk by distributors is strikingly similar to the situation that obtains when distributors purchase their milk in accordance with the provisions of a formal classified price plan. In the former situation, there is a close approximation to the purchase of milk on a classified price basis, considering the market as a whole, due to the fact that those distribution units which are highly specialized, i.e., which distribute by far the larger portion of the milk they secure as fluid milk, tend to pay higher prices for milk than distribution units which are less highly specialized, i.e., which utilize relatively more of the milk they secure as manufacturing milk. The difference between this method of purchasing milk and a formal classified price method of purchasing is merely one of the degree and precision with which milk is classified in accordance with the use made thereof.

Producers' cooperative associations have recognized the principles noted above in bargaining with distributors and have developed the system of formal class prices whereby milk is priced by cooperatives to distributors in accordance with the form in which milk is sold by distributors. Thus, a formal system of class prices, intended to secure the same result, is substituted for the rather informal system of class prices discussed above. The distributor with the larger use of milk in fluid sales pays a higher average price than the one with a considerable utilization in manufactured products. The system of formal class prices has the advantage for the producers' cooperative association of simplifying the bargaining arrangements, since it automatically establishes the basis of payment for the different dealers once the general terms for the market are determined. Without class prices, individual bargains would be necessary with each dealer in order to insure producers the full value of their particular milk, and the association would be exposed to the criticism of over- or under-pricing the milk of particular producers and over- or undercharging particular distributors. Class prices dispose of this necessity for individual bargains and result in payments corresponding to the prices which would have been arrived at under proper individual bargaining.

In addition to the seasonal factors treated above which lead to the development of a classified price plan of selling milk to distributors, there are certain types of organization of supply that would lead to the development of a formal class price system, even though the volume of milk produced throughout the year and the volume of milk consumed in the market throughout the year were precisely correlated, except for daily variations in demand and supply. In such cases, the reason for the development of a classified price plan is to be found in the fact that there must be brought to market a volume of milk in excess of daily average sales, such excess volume being needed to meet daily variations in sales.

It is rather well recognized that there are significant variations in the amount of milk sold from day to day in a fluid milk market, such variations being attributable to such factors as (1) consumption and working habits of the people which tend to show a regular day of the week variation, (2) holidays, and (3) changes in temperature.

Consumption and working habits of the people are such as to cause a rather regular day of the week variation in the sales of various products. Most business concerns, for example, do not operate on Sunday and many also close operations on Saturday afternoons. The Sunday dinner is frequently a heavier and more elaborate meal than that served on week days. These factors affect wholesale and retail sales of the various products differently. Wholesale sales of milk and cream are ordinarily low on Sunday, with sales to restaurants and cafeterias also low on Saturday. Sales of cream to stores are usually large on Saturday, Friday and Monday. Route sales of milk and cream are heavier on Sunday.

Examples of the variation in the average sales on various days of the week for several markets are given in tables 6 to 10, inclusive. In general, the greatest variation is found in cream sales, the range for the New York market for all cream being from 84.7 percent of the average daily sales for the week on Sunday to 127.9 percent on Saturday. For all milk in the same market the range was from 90.2 percent of the average daily sales for the week on Sunday to 102.8 percent on Friday. ^{20/} Examination of the tables indicates a greater variation in wholesale sales of fluid milk than of the retail sales, but in the case of cream the reverse may be the case. These variations differ in the various sections of a large city depending largely upon the economic status of the consumers and the number of persons who lunch away from home during the day. ^{21/} Since dealers have varying proportions of retail and wholesale business and serve different sections of the population, they are unlikely to have variations in sales corresponding to those in the market as a whole. Some dealers will have larger variations in sales and others smaller variations. The difference in the character of the business of dealers and the consequent differences of sales by day of the week, even for the same type of products, are shown in tables 11 to 14, inclusive. These tables show the variation in the sales of Milwaukee, Wisconsin, dealers during the week of April 22 to 28, 1934. The daily sales of each dealer have been shown as a percentage of his own average daily sales for the week. This variation in sales among dealers means that the excess milk above the average daily sales of the market is higher than would be the case if dealers had available some method of integrating their individual fluctuations in sales with other dealers having different fluctuations, through a shifting of milk between them.

^{20/} Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, United States Department of Agriculture - Technical Bulletin 73, 1928.

^{21/} Ibid, p. 32.

Table 7. Daily fluctuation in sales of milk and cream in the New York Metropolitan Area, 1924.

Type of sale	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
<u>Retail sales of milk</u>							
Qts., Grade B	103.7	99.5	99.6	99.8	99.2	99.3	98.9
Qts., Grade A	100.5	100.0	100.2	100.3	99.8	99.8	99.4
Qts., Certified	98.9	100.9	99.8	100.6	100.6	100.3	98.9
Qts., Buttermilk	76.4	106.9	106.5	106.3	102.9	106.5	94.5
Pts., Grade B	77.6	106.8	106.9	108.0	108.0	107.2	85.5
1/2 Pts., Condensed	106.0	96.9	99.0	105.8	93.8	94.7	103.8
	:	:	:	:	:	:	:
<u>Retail sales of cream</u>							
1/2 Pts., Light	108.0	98.0	99.7	103.5	97.8	96.6	96.4
1/2 Pts. Extra Heavy	176.3	83.4	88.8	92.3	86.2	82.1	90.9
	:	:	:	:	:	:	:
<u>Wholesale sales of milk</u>							
Qts., Grade B	92.8	99.4	100.8	99.6	100.8	102.2	104.4
Pts., Grade B	46.8	115.2	116.8	115.7	118.4	115.9	71.2
Bulk, Grade B	73.5	107.3	103.1	104.2	104.3	107.2	100.4
Condensed Milk	42.7	114.5	86.9	93.4	83.6	130.6	148.3
Buttermilk	34.4	126.5	106.0	109.2	114.4	115.0	94.5
	:	:	:	:	:	:	:
<u>Wholesale sales of cream</u>							
Light	42.3	118.9	95.6	93.7	94.9	121.8	132.8
Extra Heavy	72.9	107.7	88.9	91.4	86.6	112.2	140.3
	:	:	:	:	:	:	:

Compiled from "Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York," by H. A. Ross, United States Department of Agriculture, Technical Bulletin No. 73, June 1928.

Table 8. Daily fluctuation in retail, wholesale and total sales of fluid milk and cream in Reading, Pennsylvania.

Type of sale	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Milk:							
Retail	107.49	95.18	98.62	98.54	99.01	99.18	101.97
Wholesale	61.36	106.27	102.46	102.86	104.50	115.20	107.35
Total	91.90	98.93	99.92	100.00	100.86	104.60	103.79
Cream:							
Retail	136.07	87.18	99.62	96.63	87.51	85.99	107.01
Wholesale	77.21	102.33	96.32	111.62	105.01	95.83	111.67
Total	112.91	93.14	98.32	102.53	94.40	89.87	108.84

Compiled from "Distribution and Consumption of Milk in Reading, Pennsylvania,"
by T. K. Cowden, Pennsylvania Agricultural Experimental
Station, Technical Bulletin 614, November 8, 1933.

Table 9. Daily fluctuation ^{1/} in sales of certain dairy products in Chicago and suburbs.

Type of sale	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Milk, Quarts	104.7	97.2	99.9	99.3	100.4	100.4	100.0
Milk, Pints	64.3	100.8	104.2	104.9	104.4	105.2	81.3
22% Cream, 1/2 Pints	153.7	93.7	100.7	99.3	103.1	97.6	99.3
32% Cream, 1/2 Pints	311.9	76.4	88.1	96.3	107.3	93.0	115.3

Compiled from "The Marketing of Milk in the Chicago Dairy District," Illinois Agricultural Experiment Station Bulletin No. 269.

^{1/} Based on average retail sales to more than 200,000 families during the three-year period 1920-1922. Average sales for the five days Tuesday, Wednesday, Thursday, Friday and Saturday = 100 percent.

Table 10. Daily fluctuation in sales and receipts of milk and cream for the Pittsburgh market, during the last two weeks of July, 1933. 1/

Type of sale	Percentage of average daily sales for the week					
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	Percent	Percent	Percent	Percent	Percent	Percent
Regular fluid milk	76.25	105.16	102.56	100.69	102.01	109.44
Special fluid milk	95.09	97.74	103.66	97.06	105.17	96.31
Total fluid milk	76.67	104.99	102.58	100.61	102.08	109.15
Fluid Cream	92.36	92.41	100.60	93.22	105.57	99.82
Dealer purchases of milk and cream	98.35	97.26	100.21	102.83	101.31	98.55

Compiled from "The Distribution and Consumption of Milk in Allegheny County, Pennsylvania," by T. K. Cowden, and C. G. Gifford, Pennsylvania Agricultural Experiment Station Technical Paper 641, March 13, 1934.

1/ Based on reports received from 35 dealers handling 77 percent of the fluid milk sales in the market.

Table 11. Daily fluctuation in the sales of milk and cream in Williamsport, Pennsylvania, March, April and May 1933.

Percentage of average daily sales for the week							
Type of sale	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Milk							
Retail	102.35	97.81	99.99	100.04	99.71	99.69	100.40
Wholesale	65.86	104.23	102.25	105.63	105.70	111.06	105.25
Total	94.94	99.17	100.80	101.15	100.76	102.97	101.09
Cream							
Retail	138.75	87.51	97.81	96.18	90.10	88.15	101.52
Wholesale	88.92	95.35	93.73	102.59	93.77	106.94	118.20
Total	111.75	93.14	95.16	98.23	92.46	99.07	110.19

Compiled from "Distribution and Consumption of Milk in Williamsport, Pennsylvania," by T. K. Cowden, Pennsylvania Agricultural Experiment Station Technical Paper No. 615, November 8, 1933.

Holidays also exert a considerable influence upon milk and cream sales, since these are occasions for special activities. On certain of these days, notably during the summer, there is a considerable movement of people out of the city, while other holidays are feast days. In general, milk consumption appears to be somewhat decreased on holidays except for increases at Thanksgiving and Christmas. Sales of extra heavy cream at Christmas and Thanksgiving increase by over eighty per cent. Data for the New York market are given in Table 15.

Temperature is also an important factor in short-time variations in the demand for milk. In general, an increase in temperature is associated with an increase in demand, and a decrease in temperature is associated with a decrease in demand. In the New York market it was found that temperature changes in winter are more marked than in summer but that a change of a given number of degrees produced about three times as great a change in summer as a similar change in the winter. ^{22/}

On the basis of the foregoing, it appears that a considerable volume of milk in excess of average daily sales must be brought to market in order to have a supply sufficient to cover daily variations in the demand for milk. Few data are available relative to the necessary size of this daily excess, hereinafter termed the operating reserve, but it appears to range from ten to twenty percent of average daily sales at least, and perhaps higher in some markets.

If the producers in the market so organize their service of supply to the distributors so as to remove from them entirely or even partly the necessity of carrying this "operating reserve", producers can secure a higher price for the delivered milk since the distributor has always available all the milk he needs for his fluid milk trade and is also relieved of the necessity of procuring his milk from a large number of individual producers and is under no necessity of taking milk, a portion of which must be disposed of in channels other than fluid milk. This is one of the services which operating producers' cooperative associations commonly provide distributors purchasing from them. They are thus able to sell distributors milk at a higher price than they are able to secure when distributors are not so serviced. There would thus arise what amounts to a class price for milk, distributors paying a certain price for the milk called for from the association and used for fluid purposes, with the association utilizing the remaining milk in the most profitable possible manner but in uses yielding somewhat lower returns than the fluid sales. The difference between the prices charged distributors for

^{22/} Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, United States Department of Agriculture Technical Bulletin No. 73, pp. 39-44.

Table 12. Daily fluctuation in wholesale sale of
pints of regular milk, Milwaukee, April
22-28, 1934.

Company	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wed.	Thurs.	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
H	103.0	113.2	123.5	72.1	154.4	72.1	154.4
I	110.3	133.6	135.2	139.4	140.4	131.7	8.7
M	7.8	134.4	127.7	128.2	131.0	137.3	33.6
R	73.3	115.1	95.5	102.1	109.9	124.3	79.8
S	25.9	129.6	51.9	25.9	181.5	155.6	129.6
D	2.1	85.6	139.1	152.0	128.5	128.5	64.2
K	59.1	106.8	88.6	70.5	213.6	75.0	86.4
O	35.7	123.5	103.8	120.8	109.8	112.0	82.4
T							
U	0.0	116.6	116.7	116.7	116.7	116.7	116.7
A	215.5	90.0	81.5	78.6	82.8	79.9	71.7
C	67.7	124.2	101.6	146.8	90.3	112.9	56.5
V	65.8	103.5	103.1	112.9	116.9	96.7	98.1
B	15.6	132.4	131.7	133.8	123.8	122.8	39.9
E	0.0	197.1	156.3	149.5	156.3	13.6	27.2
F	0.0	0.0	0.0	700.0	0.0	0.0	0.0
L	61.3	102.3	123.7	113.2	139.0	72.0	82.4
P							
Q							
Y	100.0	0.0	0.0	200.0	0.0	200.0	200.0
Weighted:							
average:							
for all:	69.6	119.1	115.6	116.5	117.6	112.6	49.0
dealers:							

Compiled from unpublished data secured during the Milwaukee Milk Survey conducted by the Federal Emergency Relief Administration, and Wisconsin Emergency Relief Administration under the direction of the Agricultural Adjustment Administration.

Table 13. Daily fluctuation in retail sales of
quarts of regular milk, Milwaukee,
April 22-28, 1934

Company	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
H	91.9	96.2	103.0	98.6	103.6	102.9	103.8
I	99.6	97.6	100.2	100.2	100.7	100.8	100.9
M	100.2	96.2	99.0	100.1	100.9	99.7	103.9
R	102.2	96.5	101.7	98.8	100.8	98.0	102.0
S	99.3	97.4	102.2	96.3	99.7	98.7	104.4
D	96.4	101.1	95.8	102.8	102.7	97.8	103.4
J	100.1	103.3	98.9	98.5	92.7	99.2	107.3
K	99.3	97.4	100.8	100.0	100.2	100.3	102.0
U	98.7	99.6	100.5	99.9	99.1	100.2	102.0
A	100.7	97.3	98.1	100.0	101.1	99.2	103.6
C	97.3	103.4	99.7	95.4	104.1	98.9	101.2
V	99.4	96.9	101.8	101.3	102.8	99.2	98.6
B	99.8	98.1	97.8	101.0	101.9	97.6	103.8
E	96.3	100.7	95.1	103.6	102.7	96.3	105.3
F	95.3	102.4	95.5	102.9	101.4	98.6	103.9
G	95.1	95.0	100.4	99.2	101.2	100.1	105.0
L	97.9	96.3	99.4	103.5	103.7	98.8	100.4
P	99.0	98.5	99.3	100.5	100.1	101.0	101.6
Q	98.9	98.9	99.3	96.5	103.9	99.9	102.6
Y	99.0	100.8	97.4	99.8	100.0	100.8	102.2
Weighted average for all dealers	99.7	97.9	98.4	100.4	101.3	99.0	103.3

Compiled from unpublished data secured during the Milwaukee Milk Survey conducted by the Federal Emergency Relief Administration and the Wisconsin Emergency Relief Administration under the direction of the Agricultural Adjustment Administration.

Table 14. Daily fluctuation in wholesale sales of
quarts of 18% cream, Milwaukee, April 22-
28, 1934

Company	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
H	35.9	89.7	80.7	107.7	116.7	98.7	170.6
I	78.4	106.4	95.2	89.6	95.2	117.6	117.6
M	80.6	115.1	96.7	71.4	87.5	78.3	170.4
R	100.0	76.5	100.0	70.6	129.4	94.1	129.4
S	116.7	53.3	116.7	58.2	116.7	116.7	116.7
D	0.0	0.0	0.0	0.0	700.0	0.0	0.0
J	33.3	166.7	66.7	100.0	100.0	200.0	33.3
K	83.1	99.0	87.9	95.8	97.4	111.7	125.1
O	9.5	131.8	113.0	116.1	103.6	119.3	106.7
T							
U	53.8	107.7	107.7	107.7	107.7	107.7	107.7
A	97.6	91.0	101.6	88.3	101.6	90.7	129.2
C	65.1	114.0	146.4	97.7	97.7	65.1	114.0
V	75.4	86.2	53.8	96.9	96.9	118.5	172.3
B	72.6	103.6	94.7	108.9	95.8	101.8	122.6
E	89.1	50.9	127.3	101.8	101.8	76.4	152.7
F	116.7	58.3	116.7	116.7	0.0	58.3	233.3
G	94.2	67.4	114.4	107.7	107.7	94.2	114.4
L	311.1	0.0	77.8	0.0	77.8	155.5	77.8
P	41.2	41.2	41.2	123.5	41.2	82.4	329.3
Q	0.0	0.0	0.0	0.0	0.0	700.0	0.0
Y	140.0	93.3	93.3	93.3	186.8	0.0	93.3
Weighted							
Average	77.0	99.9	95.9	97.7	98.8	101.5	129.2
all deal- ers							

Compiled from unpublished data secured during the Milwaukee Milk
Survey conducted by the Federal Emergency Relief Administration
and the Wisconsin Emergency Relief Administration under the di-
rection of the Agricultural Adjustment Administration.

Table 15. Daily fluctuation in retail sales of
half pints of 18% cream, Milwaukee,
April 22-28, 1934

Company	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
H	119.5	85.4	97.4	119.5	78.5	100.7	99.0
M	152.0	74.7	92.8	93.1	90.7	89.6	107.1
R	206.1	76.4	84.0	81.5	89.1	76.4	86.5
S	301.3	35.4	53.2	57.6	79.7	66.5	106.3
D <u>1</u> / ₂	211.7	78.4	96.3	0.0	88.0	101.8	123.8
K <u>2</u> / ₂	165.6	82.8	90.3	94.1	86.6	82.8	97.8
E	164.0	84.0	89.3	97.3	73.4	84.0	108.0
G	95.5	190.8	0.0	79.5	143.2	95.5	95.5
Weighted:							
average :	159.9	76.5	91.3	88.0	88.6	89.3	106.4
all deal- ers :							

Compiled from unpublished data secured during the Milwaukee Milk Survey conducted by the Federal Emergency Relief Administration and the Wisconsin Emergency Relief Administration under the direction of the Agricultural Adjustment Administration.

1/ 19%

2/ 18 $\frac{1}{2}$ %

Table 16. Effect of holidays on sales of retail milk and cream in the New York Metropolitan Area - 1924.

	Change in sales 1/cent											
Product	New Year's Day	Lincoln's Birth day	Washington's Birth day	Easter	Passover week	Memorial Day	Fourth of July	Labor Day	Yom Kippur	Thanksgiving	Christmas	
	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	
Quarts - Grade B	- 1.4	+ 1.2	- .6	0	- 1.5	- 1.2	- 2.4	- 6.0	0	+ .6	+ 3.0	
Quarts - Grade A	0	- 1.2	- .6	- .6	- 1.4	- 1.2	- 2.4	- 4.8	0	+ .6	+ 1.2	
Quarts -Certified	- 3.0	- 1.8	- 2.9	.0	- 1.8	- 1.2	- 1.8	- 6.5	-. 6	- 1.2	- 1.8	
Pints - Grade B	-24.0	-10.4	-20.7	+1.6	- 2.6	-26.5	-28.3	-29.8	-5.5	-25.1	-26.1	
Extra heavy cream	+44.0	+ 2.1	+11.1	+2.8	-. 6	+23.3	+27.8	- 7.8	-1.9	+83.4	+83.7	

Compiled from "Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York," United States Department of Agriculture, Technical Bulletin No. 73 - June, 1928.

$\frac{1}{\text{cent}}$ Percentage change from the average corrected sales for the three days preceding and the three days following the holiday.

milk that is sold by them as fluid-milk and the price the association receives for milk in other uses is, other factors being the same, the premium distributors are willing to pay for milk when such milk is furnished them in conformance with their daily needs.

Although there may be other factors that, in a particular market, also contribute to the development of a system of class prices, the foregoing treatment suffices to explain the more important considerations obtaining that, taken as a whole, lead to the development of class prices in most important milk markets.

Literature Cited

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- Ross, H. A., Cornell University, Agri. Exp. Station Bulletin No. 527.
- Ross, H. A., The Marketing of Milk in the Chicago Dairy District, Illinois Agri. Exp. Station Bulletin No. 269.
- Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, U. S. Dept. of Agri. Technical Bulletin No. 73.

A P P E N D I X

Table 17. Index numbers of seasonal variation in fluid milk sales by distributors purchasing from cooperative associations.

	Baltimore	Boston	Twin Cities
	Percent	Percent	Percent
January	97.7	96.9	98.8
February	98.6	97.6	101.0
March	100.2	98.6	101.4
April	100.4	97.2	101.8
May	103.1	99.5	99.5
June	101.4	102.8	98.1
July	99.0	106.8	98.0
August	96.4	103.1	99.1
September	100.5	100.5	100.1
October	103.0	100.4	102.5
November	101.0	100.7	101.7
December	98.7	95.9	98.0
Average	100.0	100.0	100.0

Index numbers were calculated by the median-link-relative method from data of fluid milk sales, omitting those months in which price changes occurred. For basic data used in computing the index for Baltimore see tables 17 and 18; for Boston, see tables 19 and 20; and for Twin Cities, see tables 21 and 22.

1/
Table 18. Fluid milk sales of Maryland State Dairymen's Association, December 1923-December 1931.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	000	000	000	000	000	000	000	000	000	000	000	000	000
	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons	gallons
1923													
1924	1,171	1,207	1,230	1,237	1,262	1,254	1,262	1,287	1,313	1,367	1,368	1,348	1,275
1925	1,347	1,338	1,428	1,445	1,489	1,552	1,491	1,439	1,525	1,578	1,508	1,490	1,468
1926	1,476	1,489	1,517	1,530	1,592	1,570	1,539	1,490	1,544	1,582	1,510	1,481	1,525
1927	1,480	1,512	1,549	1,536	1,562	1,558	1,538	1,485	1,554	1,598	1,562	1,558	1,541
1928	1,527	1,549	1,571	1,549	1,596	1,562	1,517	1,481	1,506	1,575	1,555	1,514	1,542
1929	1,517	1,526	1,547	1,551	1,673	1,566	1,528	1,495	1,571	1,575	1,555	1,510	1,551
1930	1,497	1,507	1,543	1,534	1,592	1,561	1,517	1,493	1,587	1,469	1,509	1,465	1,523
1931	1,434	1,450	1,431	1,470	1,491	1,462	1,435	1,407	1,468	1,457	1,414	1,376	1,441

Compiled from "History of Maryland State Dairymen's Association," Appendix Table VI.

1/ Adjusted to 30 day month.

Table 19. Retail prices of milk per quart delivered in Baltimore, 1924-1931

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1924	13	13	13	13	13	13	13	13	13	13	13	13	13
1925	13	13	13	13	13	13	13	13	13	13	13	13	13
1926	13	13	13	13	13	13	13	13	13	14	14	14	13
1927	14	14	14	14	14	14	14	14	14	14	14	14	14
1928	14	14	14	14	14	14	14	14	14	14	14	14	14
1929	14	14	14	14	14	14	14	14	14	14	14	14	14
1930	14	14	14	14	14	14	14	14	14	14	14	14	14
1931	14	14	14	13	12	12	12	12	12	12	12	12	12

Compiled from reports of the United States Department of Labor, Bureau of Labor Statistics.

Table 20. Monthly fluid milk sales^{1/} by large dealers in Boston, 1922-1931.

Year:	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :	: Mil. :
: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :	: pounds :
1922:	21.4	21.7	22.0	21.5	22.8	23.9	23.4	22.9	22.6	22.5	22.7	21.3	22.4
1923:	22.0	22.4	23.0	22.6	23.6	25.6	24.5	23.7	23.2	23.6	23.5	22.6	23.4
1924:	22.9	23.1	24.1	24.5	25.2	26.2	27.2	26.1	24.6	24.1	24.4	23.8	24.7
1925:	24.2	24.6	25.2	25.2	25.5	28.0	27.2	26.3	25.7	25.8	26.1	25.4	25.8
1926:	25.9	26.1	26.5	26.5	27.0	27.6	28.9	27.5	27.2	28.4	28.4	26.6	27.2
1927:	27.2	27.8	28.6	28.4	27.9	29.0	29.8	28.2	28.2	28.7	28.1	27.8	28.3
1928:	28.7	29.0	29.5	28.9	29.5	29.9	31.3	31.4	29.4	30.6	31.1	29.8	29.9
1929:	30.5	30.8	31.5	31.0	32.0	32.8	32.8	31.7	31.0	30.4	30.7	29.1	31.2
1930:	29.6	30.0	30.4	30.2	31.2	31.4	30.5	29.7	30.6	29.7	29.1	28.2	30.1
1931:	30.0	29.6	30.2	29.9	31.8	30.2	31.6	30.6	30.1	30.3	29.7	28.5	30.2

^{1/} Adjusted to thirty-day month.

Data supplied by W. H. Bronson of the New England Milk Producers' Association.

Table 21. Retail prices of milk per quart delivered in Boston, 1922-1931.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :
	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :
	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:	: Cents:
1922	: 13.5:	: 13.5:	: 13.5:	: 12.5:	: 12.5:	: 12.5:	: 13.5:	: 13.5:	: 13.5:	: 14.5:	: 14.5:	: 14.5:
1923	: 14.5:	: 14.5:	: 14.5:	: 13.5:	: 13.5:	: 13.5:	: 14.0:	: 14.5:	: 14.5:	: 14.5:	: 15.5:	: 15.0:
1924	: 14.5:	: 13.5:	: 12.5:	: 12.0:	: 12.0:	: 12.0:	: 12.5:	: 13.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:
1925	: 14.5:	: 14.5:	: 13.5:	: 13.5:	: 13.0:	: 13.0:	: 14.0:	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:
1926	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 13.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 14.0-
1927	: 14.0:	: 14.0:	: 14.0:	: 14.0:	: 14.0:	: 14.0:	: 14.0:	: 15.0:	: 15.0:	: 15.5:	: 15.5:	: 16.5:
1928	: 16.0:	: 15.5:	: 15.5:	: 14.5:	: 14.5:	: 14.5:	: 14.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:
1929	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 14.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:
1930	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 14.5:	: 14.5:	: 14.5:	: 15.5:	: 15.5:	: 15.5:	: 15.5:	: 13.5-
1931	: 13.5:	: 12.5:	: 12.5:	: 12.5:	: 12.5:	: 12.5:	: 12.5:	: 13.5:	: 13.5:	: 13.5:	: 13.5:	: 13.0-
	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: :	: 12.5:
Data supplied by J. H. Bronson of the New England Milk Producers' Association.												

Note: During the period April 1, 1923 to September 4, 1927 some dealer's prices were 1/2 cent higher than the prices indicated above.

Table 22. Fluid milk sales 1/ to distributors by Twin City Milk Producers' Association, 1924-1932.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	: 000	: 000	: 000	: 000	: 000	: 000	: 000	: 000	: 000	: 000	: 000	: 000
	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds	: pounds
1924	: 11,098	: 11,541	: 11,279	: 11,876	: 11,720	: 11,814	: 11,871	: 11,799	: 11,788	: 12,318	: 12,225	: 11,843
1925	: 11,958	: 12,265	: 12,572	: 12,710	: 11,720	: 12,572	: 12,210	: 12,570	: 13,052	: 12,492	: 12,421	: 11,861
1926	: 12,079	: 12,178	: 12,246	: 12,331	: 12,522	: 12,170	: 12,004	: 11,990	: 11,988	: 12,368	: 12,293	: 12,002
1927	: 12,246	: 12,485	: 13,775	: 12,474	: 12,005	: 11,912	: 11,769	: 12,111	: 12,737	: 12,438	: 12,608	: 12,100
1928	: 12,480	: 12,634	: 12,782	: 12,729	: 12,919	: 12,238	: 12,270	: 12,436	: 12,439	: 13,607	: 13,406	: 12,644
1929	: 12,785	: 12,942	: 12,968	: 13,086	: 12,820	: 12,437	: 12,432	: 12,684	: 13,053	: 13,495	: 13,433	: 12,980
1930	: 13,256	: 13,571	: 13,648	: 13,646	: 13,119	: 13,004	: 13,142	: 13,097	: 13,346	: 13,543	: 13,487	: 12,860
1931	: 12,961	: 13,277	: 13,201	: 13,268	: 13,821	: 12,842	: 12,993	: 12,162	: 12,568	: 12,308	: 12,724	: 12,065
1932	: 12,203	: 12,543	: 12,724	: 12,288	: 12,534	: 12,571	: 12,717	: 12,771	: 12,612	: 12,093	: 11,862	

Computed from data in National Cooperative Milk Producers' Federation, History Series No. 7. "Twin City Milk Producers' Association." Appendix Table IV.

1/ Adjusted to 30-day month.

Table 21. Sales and retail prices of fluid milk in the Boston Sales Area.

Year and month	Class I sales of milk	Milk reported as percent of estimated total sales	Estimated total sales	Estimated average daily Class I sales	Retail price delivered per quart	Retail store price per quart	Class I price per cwt. of 3.7% milk f.o.b. City
	000 lbs.	Percent	000 lbs.	000 lbs.	Cents	Cents	Dollars
1934							
April	41,349	89.5	46,190	1,540	11	10	2.95
May	44,599	89.0	50,111	1,616	11	10	2.95
June	43,632	89.5	48,751	1,625	11	10	2.95
July	48,117	89.5	53,762	1,734	11	10	2.95
August	44,735	90.0	49,706	1,603	11	10	2.95
September	42,847	90.0	47,608	1,587	11	10	2.95
October	44,729	90.0	49,699	1,603	12	11	3.26
November	43,482	88.5	49,132	1,638	12	11	3.26
December	42,698	88.0	48,520	1,565	12	11	3.26
1935							
January	43,207	88.0	49,099	1,584	12	11	3.26
February	38,231	87.0	43,944	1,569	12	11	3.30
March	42,573	86.0	49,503	1,597	13	12	3.49
April	40,122	86.0	46,653	1,555	13	12	3.49
April to September				1,618	11		
October to February				1,592	12		
% change				-1.6	+9.1		
March and April				1,576	13		
% change				-1.0	+8.3		

Sales and Class I price compiled from reports of Market Administrator.
 Retail prices compiled from reports of U. S. Department of Agriculture Market News Service.

Table 25. Sales and retail prices of fluid milk in the Detroit Sales Area.

Year and month	Milk		Daily		Class	
	Class I	reported	Estimated	Estimated	sales	Retail
	sales	as percent	total	average	adjusted	delivered
	of milk	of esti- mated	Class I sales	daily Class I sales	for sea- sonal Va- riation ¹	price per quart
	000 lbs.	Percent	000 lbs.	000 lbs.	000 lbs.	Cents
1934						
April	35,448	90	39,387	1,313	1,275	10
May	37,853	98	38,626	1,246	1,217	10
June	35,957	99	36,320	1,211	1,172	10
July	35,496	98	36,220	1,168	1,180	11
August	34,344	98	35,045	1,130	1,137	11
September	33,731	97	34,774	1,159	1,175	11
October	34,776	98	35,486	1,145	1,128	11
November	33,419	98	34,101	1,170	1,195	11
December	33,671	98	34,358	1,108	1,143	11
1935						
January	34,804	95	36,636	1,182	1,231	11
February	31,948	98	32,600	1,141	1,146	11
March	35,868	98	36,600	1,181	1,153	12
April to June				1,257	1,221	10
July to February				1,150	1,167	11
% change				-8.5	-4.4	+10.0
March				1,181	1,153	12
% change				+2.7	-1.2	+9.1

Sales and Class I price: Compiled from reports of Market Administrator.

Retail prices: Compiled from reports of the United States Department of Agriculture Market News Service.

¹/ See test for index used.

Table 26. Sales and retail prices of fluid milk
in the Evansville Sales Area.

Year and month	: :Class I :sales of :butter- :fat :	:Milk re- :ported as :percent of :estimated :total :sales	: :Estimated :total :sales of :butterfat :	:Estimated :average :daily :Class I :sales of :milk :equivalent:	:Retail: :deliv- :ered :price :per :quart :	:Retail: :store :price :per :quart :	:Class I :price per :pound :butterfat :f.o.b. :city
	: :Pounds :	: :Percent :	: :Pounds :	: :Pounds :	: :Cents :	: :Cents :	: :Cents :
1934							
March	: 55,017	: 90	: 61,130	: 51,893	: 8.32	: 8.2	: 48
April	: 47,589	: 90	: 52,877	: 46,383	:	: 9	: 48
May	: 46,979	: 87	: 53,999	: 45,840	: 9	:	: 48
June	: 46,210	: 85	: 54,365	: 47,689	: 9	: 8-9	: 48
July	: 47,767	: 95	: 50,281	: 42,683	: 9	: 8-9	: 48
August	: 45,008	: 90	: 50,009	: 42,452	: 9	: 8-9	: 48
September	: 40,557	: 88.6	: 45,775	: 40,154	: 9	: 8-9	: 48
October	: 42,407	: 87	: 48,744	: 41,404	: 9.5	: 9-10	: 48
November	: 41,153	: 89	: 46,239	: 40,561	: 9.5	: 9-10	: 51.5
December	: 41,184	: 88	: 46,800	: 39,728	: 9.5	: 9-10	: 53
1935							
January	: 43,351	: 90	: 48,168	: 40,890	: 9.5	: 9-10	: 53
February	: 40,059	: 88	: 45,522	: 42,784	: 9.5	: 9-10	: 53
March	: 45,090	: 89	: 50,663	: 44,441	: 9.5	: 9-10	: 53
May to Sept.	:	:	:	: 45,764	: 9	:	:
Oct. to Mar.	:	:	:	: 41,635	: 9.5	:	:
Percent change	:	:	:	: -4.9	: + 5.6	:	:

NOTE: Percentage changes from March sales and prices were not calculated since sales during that month appear to have been unduly high.

Sales and Class I prices: Compiled from reports of Market Administrator.
Retail prices: Compiled from reports of the United States Department of
Agriculture Market News Service.

Year and month:	Class I		Milk report--		Estimated		Estimated Retail		Retail: Class I	
	sales	of milk	ed as per-	cent of es-	total	Class I	average delivered:	price per:	store:	price per
:	:	:	estimated to-	total Class I	Class I	Class I	Class I:	per:	per:	per:
:	:	:	total Class I	Class I	Sales	Sales	Class I:	quart	quart	quart
:	:	:	Percent	Pounds	Pounds	Pounds	Cents	Cents	Cents	Dollars
:	:	:	:	:	:	:	:	:	:	:
<u>1934</u>										
August	3,850,687		97.9	3,933,286	126,880	9	9.0			1.85
September	3,809,520		99.7	3,820,983	127,366	9	9.5			1.85
October	3,920,693		99.0	3,960,296	127,751	10	10.0			1.85
November	3,758,861		99.0	3,796,829	126,561	10	10.0			2.10
December	3,848,021		99.6	3,863,475	124,628	10	10.0			2.10
<u>1935</u>										
January	3,906,824		99.0	3,946,287	127,300	10	10.0			2.10
February	3,575,805		99.0	3,611,921	128,997	10	10.0			2.10
March	3,928,662		99.0	3,968,345	128,011	10	10.0			2.10
August & September						9				
October to March						10				
% Change						+ 11.1				

Sales and Class I price compiled from Reports of Market Administrator.
Retail prices compiled from reports of U. S. Department of Agriculture Market News Service

Table 28. Sales and retail prices of fluid milk
in the Kalamazoo Sales Area

Year and month	:Class I :Sales of :Milk	:Milk re- :ported as: :percent :of estima- :ted total: :Class I :Sales	:Estimated :total :Class I :Sales	:Estima- :ted av- :erage :daily :Class :I :Sales	:Retail :deliv- :ered :and :store :prices :per qt.:	:Class I :price per :cwt. of :3.5% milk :f.o.b. :City
	:Pounds	:Percent	:Pounds	:Pounds	:Cents	: Dollars
<u>1934</u>						
July	: 1,236,034:	98	:1,261,259	:40,686:	10	: 1.85
August	: 1,053,642:	98	:1,075,145	:34,682:	10	: 1.85
Sept.	: 1,043,354:	98	:1,064,647	:35,488:	10	: 1.85
October:	1,078,968:	98	:1,100,987	:35,516:	10	: 1.85
November	1,062,866:	95	:1,118,806	:37,294:	10	: 1.85
December	1,145,373:	95	:1,205,656	:38,892:	8	: 1.85
<u>1935</u>						
January	: 1,211,198:	97	:1,274,945	:41,127:	8	: 1.85
February:	1,144,550:	98	:1,179,948	:42,141:	8	: 1.85
March	: 1,196,868:	95	:1,221,294	:39,397:	10	: 2.00
July to	:	:	:	:	:	:
November:	:	:	:	:36,733:	10	:
December:	:	:	:	:	:	:
to Feb.:	:	:	:	:40,720:	8	:
%Change	:	:	:	:+ 10.9:	-20.0	:
March	:	:	:	:	:	:
% Change:	:	:	:	:39,397:	10	:
	:	:	:	: -3.2:	+ 25.0	:

Sales and Class I Prices compiled from reports of Market Administrator.
Retail prices compiled from reports of U. S. Department of Agriculture
Market News Service.

Table 29. Sales and retail prices of fluid milk in the St. Louis Sales Area.

Year and month	:Class I sales of milk	:Milk re-ported as percent of estimated total Class I sales	:Estimated total Class I sales	:Estimated average daily Class I sales	:Index of average daily Class I sales	:Retail delivered price per quart	:Class I price of 3.5% milk f.o.b. city
	: 000 Lbs.	: Percent	: 000 Lbs.	: 000 Lbs.	: Per-cent	: Cents	: Dollars
<u>1934</u>							
April	: 16,824	: 99.8	: 16,858	: 562	: 102	: 11	: 1.85
May	: 18,091	: 100.0	: 18,091	: 584	: 106	: 11	: 1.85
June	: 17,928	: 100.0	: 17,928	: 598	: 109	: 11	: 2.00
July	: 18,229	: 99.7	: 18,284	: 590	: 107	: 11	: 2.00
August	: 17,482	: 99.8	: 17,517	: 565	: 102	: 11	: 2.20
September	: 16,167	: 99.7	: 16,216	: 541	: 98	: 11	: 2.35
October	: 16,923	: 99.5	: 17,008	: 549	: 99	: 11	: 2.35
November	: 15,676	: 97.9	: 16,012	: 534	: 97	: 11	: 2.18
December	: 15,769	: 99.8	: 15,801	: 510	: 92	: 11	: 2.00
<u>1935</u>							
January	: 15,952	: 99.6	: 16,016	: 517	: 94	: 11	: 2.00
February	: 14,709	: 99.5	: 14,783	: 528	: 96	: 11	: 2.00
March	: 16,783	: 99.9	: 16,800	: 542	: 98	: 11	: 2.22
Average				: 552	: 100		

Sales and Class I prices: Compiled from Reports of Market Administrator.

Retail prices: Compiled from reports of the United States Department of Agriculture Market News Service.

APPENDIX B

Table I. - DUBUQUE, IOWA: Class I, II, III and pool prices paid to producers by the Dubuque Cooperative Association 1/

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Pool price:												
1925	2.01	2.01	1.81	1.81	1.64	1.71	1.81	1.81	1.86	2.21	2.21	2.21
1926	2.21	2.21	2.21	2.06	1.91	1.81	1.86	1.96	1.96	2.11	2.26	2.41
1927	2.41	2.21	2.21	2.21	1.96	1.81	1.91	2.01	2.16	2.21	2.26	2.26
1928	2.37 1/2	2.37	2.48	2.30	2.27	2.26	2.30	2.38	2.54	2.42	2.80	2.82
Class I	2.17 1/2	2.17	2.28	2.10	2.12	2.11	2.15	2.23	2.38	2.36	2.60	2.57
Class II	1.89 1/2	1.89	1.99	1.82	1.84	1.82	1.86	1.94	2.04	2.01	2.10	2.12
Class III	2.21 1/2	2.24	2.34	2.16	2.09	2.05	2.13	2.26	2.41	2.42	2.69	2.66
Pool Price	2.71	2.84 1/2	2.71	2.50	2.26	2.26	2.24	2.34	2.44	2.60	2.49	2.50
1929	2.51	2.64 1/2	2.51	2.30	2.06	2.06	2.04	2.14	2.24	2.38	2.29	2.30
Class I	2.01	2.14 1/2	2.07	1.90	1.81	1.80	1.79	1.84	1.94	2.00	1.68	1.70
Class II	2.54	2.66 1/2	2.52	2.26	1.96	2.01	1.96	2.08	2.25	2.41	2.30	2.27
Class III	2.32	2.38	2.41	2.30	1.91	1.91	1.91	1.91	2.10	2.40	2.28	2.00
Pool Price	2.10	2.18	2.21	2.10	1.71	1.71	1.71	1.71	1.90	2.20	2.08	1.80
1930	1.52	1.53	1.61	1.60	1.51	1.39	1.49	1.64	1.65	1.63	1.46	1.32
Class I	2.00	2.02	2.05	1.93	1.65	1.59	1.66	1.76	1.87	2.10	1.96	1.74
Class II	1.95	1.95	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Class III	1.75	1.75	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Pool Price	1.18	1.17	1.14	.96	.83	.88	.95	1.17	1.31	1.39	1.18	1.15
1931	1.58	1.53	1.35	1.24	1.16	1.17	1.27	1.40	1.46	1.50	1.40	1.40
Class I	1.60	1.60	1.39	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.14	.80
Class II	1.40	1.40	1.19 1/2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.85
Class III	.92	.85	.82	.66	.59	.63	.68	.81	.84	.83	.88	.87
Pool Price	-	-	-	-	-	.57	.62	.74	.77	.76	.79 1/2	-
1932	1.29	1.23	1.08	.89	.82	.80	.84	.94	.98	.97	.98	.83
Class I	1.60	1.60	1.39	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.14	.80
Class II	1.40	1.40	1.19 1/2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.85
Class III	.92	.85	.82	.66	.59	.63	.68	.81	.84	.83	.88	.87
Class IV	-	-	-	-	-	.57	.62	.74	.77	.76	.79 1/2	-
Pool Price	1.29	1.23	1.08	.89	.82	.80	.84	.94	.98	.97	.98	.83

(continued)

Table I. - DUBUQUE, IOWA: Class I, II, III and pool prices paid to producers
by the Dubuque Cooperative Association 1/

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
<u>1933</u>												
Class I	1.03	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Class II	.79	.74	.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Class III	.73	.68	.73	.85	.91	.94	1.00	.87	.95	.96	.96	.82
Class IV	-	-	.68	.78	.83	.86	.92	.79	.87	.88	.88	.76
Pool Price	.90	.96	.88	.94	.95	.96	1.01	.94	1.01	1.03	1.02	.84
<u>1934</u>												
Class I	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.55
Class II	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.39
Class III	.80	1.02	.99	.94	1.00	1.02	.99	1.10	1.05	1.09	1.22	1.19
Class IV	.74	.93	.90	.86	.91	.92	.91	1.01	.96	.99	1.13	1.11 ^{4/}
Pool Price	.88	.95	.95	.92	.94	.95	.97	1.00	.94	.98	1.04	1.41
<u>1935</u>												
Class I	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.75	1.90
Class II	1.57	1.67	1.50	1.58	1.29	1.18	1.19	1.23	1.27	1.34	1.52	1.59
Class III	1.29	1.37	1.23	1.30	1.06	.97	.98	1.01	1.04	1.10	1.25	1.31
Pool Price	1.49	1.52	1.46	1.46	1.28	1.19	1.21	1.25	1.28	1.41	1.61	1.76
<u>1936</u>												
Class I	1.90	1.90										
Class II	1.61	1.70										
Class III	1.32	1.39										
Pool Price	1.76	1.78										

1/ Prices paid to the Dubuque Cooperative Association January 1925-November 1935. From January 1935 to February 1936 the class prices quoted were also paid under the License No. 94 by other handlers in the Dubuque market. Prior to 1935 no definition of the milk considered in each class is available.

2/ Information for last half of the month only.

3/ Information for first half of month only.

4/ First four days only.

Compiled from the Market Administrators' Report.

Table II

B-3

DUBUQUE, IOWA: Volume of milk sold to cooperative handlers in the Dubuque Marketing Area by classes, 1928 - 1935

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1928													
Class													
I	361544	689647	764363	744254	797058	770597	773965	776213	743628	759114	687421	679069	5551873
II	668221	123709	144601	130232	136782	125928	131579	119596	125014	133631	119307	118109	1475410
III	337631	210209	231658	263766	588284	689435	500511	312630	262102	128630	99504	167058	3557650
Total	5121291	1023565	1140622	1158302	1522104	1586010	1411125	1208439	1130744	1021425	906232	964236	13584933
1929													
Class													
I	703005	366367	768307	722111	752507	735341	761861	759351	734737	726389	702377	715668	8388021
II	116813	551522	145235	142630	136721	112616	108131	110527	105713	113614	120348	109772	1377572
III	154646	784842	258475	507047	1034012	1192486	1029811	811346	456034	287354	255005	316971	6379721
Total	974464	1440032	1170317	1371788	1923240	2040443	1899803	1681224	1296534	1127357	1077730	1142411	16145314
1930													
Class													
I	715191	658773	712004	668386	701429	689716	695448	691240	670421	666078	636745	641463	8146894
II	104277	103800	111250	100902	107272	90602	90387	80896	79761	82591	79256	85221	1116215
III	452335	479238	617169	774144	1217465	1208628	1093339	845341	561875	462937	389190	454160	8556321
Total	1271803	1241811	1440423	1543432	2026166	1988946	1879174	1617977	1312057	1211606	1105191	1180844	17819430
1931													
Class													
I	632393	575003	648267	627890	649263	638118	685002	649307	627147	621555	592308	588015	7534268
II	76476	64654	72692	67554	67824	60343	63216	60593	61678	71277	66723	74863	814093
III	603635	654663	732964	797550	1095025	1007193	663730	587165	442956	510215	473530	485675	8054501
Total	1312504	1294520	1453923	1492994	1812112	1705654	1411946	1303065	1131731	1203047	1132561	1148753	16402862
1932													
Class													
I	604420	586226	599866	579796	595507	539441	539356	521012	494822	476626	476577	603292	6624013
II	71655	64609	61349	56692	53674	50400	46432	46407	46799	50643	39624	34382	623116
III	507244	504674	659623	714909	1031619	201263	153045	105580	41530	99690	192018	339494	4640929
IV	-	-	-	-	-	781405	601464	527259	467015	402862	1811653	-	2961170
Total	1183519	1215511	1350638	1351597	1684000	1572529	1340347	1200328	1050186	1031821	891384	977168	14849228

(continued)

Table II.

DUBUQUE, IOWA: Volume of milk sold to cooperative handlers
in the Dubuque Marketing Area by Classes, 1928 - 1935 (continued)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1933													
Class													
I	619584	544246	464108	429061	418426	401174	388667	375767	349700	347217	335929	341083	5015262
II	32623	28876	126430	128984	129962	118997	119023	121046	103792	108626	114976	129833	1263168
III	354726	389508	52351	45638	127426	243354	245580	186573	93473	56534	72094	97306	1964563
IV	-	-	497800	545313	783201	776704	673220	588931	398384	353148	177583	60138	4354422
Total	1007233	962630	1140689	1148996	1459015	1540229	1426490	1272317	945349	565525	700582	628360	13097415
1934													
Class													
I	372453	359316	397149	396847	451523	419400	412018	359589	346078	366500	348001	373020	4631892
II	138068	133432	142003	132345	151084	136942	139480	140839	126419	140726	150246	184106	1695690
III	81893	62076	93232	126002	373501	373731	418097	313944	145179	140544	96805	123134	2350138
IV	38884	59690	70433	73022	108458	103342	107733	93819	68632	71974	66117	77454	869849
Total	631298	614514	702817	730216	1084566	1033415	1077328	938191	686306	719744	661169	668005	9547569
1935													
Class													
I	386766	353238	391507	367025	356825	325765	341945	334674	320007	370401	350379		3895325
II	153128	140197	155973	145958	154056	146176	125548	124636	124377	147499	172670		1590218
III	183104	206930	249876	307498	600526	718496	681658	574871	433826	219961	104657		4284035
Total	722998	700365	797356	820481	1111407	1190437	1149151	1034181	878210	737861	627706		9770153

1/ Figures for only one-half of January available.

2/ Figures for second period of February not available.

3/ Figures for first period only.

4/ Figures for December 1-4 only.

5/ 11 months' total.

Compiled from the Market Administrator's Report.

Table 3. - DUBUQUE, IOWA: Dealers selling prices, retail per quart bottled.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1925	12	12	12	12	12	12	12	12	12	12	12	12	12.00
1926	12	12	12	12	12	12	12	12	12	12	12	12	12.00
1927	12	12	12	12	12	12	12	12	12	12	12	12	12.00
1928	12	12	12	12	12	12	12	12	12	12	12	12	12.00
1929	12	12	12	12	12	12	12	12	12	12	12	12	12.00
1930	12	12	11	11	10	10	10	10	10	11	12	12	12.00
1931	10	10	9	9	9	9	9	9	9	10.75	10	10	10.65
1932	9	9	8.5	8	8	8	8	8	8	9	9	9	9.20
1933	6	8	8	8	8	8	8	8	8	8	7	6	8.00
1934	10	10	9	8	8	8	8	8	8	8	8	8	7.30
1935	9	9	9	9	9	9	9	9	9	9	9.5	8.9	8.50

Compiled from reports of the Market Administrator.

Table 4. DUBUQUE, IOWA - Fluid Milk Prices
Dealers' selling prices retail per quart bottled delivered to family trade

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aver.
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1919	12	12	12	12	12	12	12	12	13 1/1	13 1/1	14	14	12.50
1920	14	14 1/1	14 1/1	14	13	13 1/1	13 1/1	13 1/1	13 1/1	14 1/1	14 1/1	14	13.58
1921						11			11	11	11		
1922	11										11		
1923	11 1/1	11	11	9	9 1/1	9 1/1	12	12	12 1/1	12 1/1	12	12 1/1	11.00
1924								10		11			
1925													
1926													
1927													
1928													
1929	11-12	12	11-12	11-12	11	11	11	11	11	11	12	11-12	11.46
1930	12	12	11.5/1	11	10	10 1/1	11	11	11	12	12	12	10.71
1931	10	10	9	9	9	9	10	10	10	11	11	10	9.17
1932	9	9	8.5/1	8	8	8	9	8 1/1	9	9	9	9	7.96
1933	6	8	8			8	8		8 1/1	8	7 1/1	6	
1934													
1935					9								
1936													

Compiled from reports of the Bureau of Agricultural Economics, Division of Dairy and Poultry Products

/1 Interpolated

Table 5. DUBUQUE, IOWA - Fluid Milk Prices.

Prevailing butterfat test of milk sold.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aver.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1921													
1922	3.6-3.8					3.6				3.6-3.8	3.6-3.8		
1923				3.7	3.6-3.8			3.6-3.9		3.6	3.8		
1924	3.9-4.0	3.8-4.0	3.7 3.9-4.0					3.6-4.0		3.5-4.0			
1925													
1926													
1927													
1928													
1929	3.8	3.8-3.9	3.8-3.9	3.8-3.9	3.8-3.9	3.7	3.9	3.9	3.9	3.8-3.9	3.8-3.9	3.7-4.0	
1930	3.7-4.0	3.7-4.0	3.8/1	3.6-4.0	3.6-4.0	3.8/1	3.7	3.7	3.7/1	3.7-3.8	3.8	3.8/1	3.78
1931	3.6-3.9	3.75/1	3.6-3.9	3.7-3.9	3.6-3.8	3.6-3.9	3.7-3.9	3.7-3.9	3.7-4.0	3.7-3.9	3.7-4.0	3.8/1	3.82
1932	3.7-3.9	3.7-3.9	3.8/1	3.7-3.9	3.7-3.8	3.7-3.9	3.7-3.9	3.7-3.8	3.7-3.8	3.6-3.8	3.7/1	3.6-3.8	3.74
1933	3.8		3.8/1	3.7-3.9	3.7-3.8	3.7-3.9	3.7-3.9	3.8/1	3.8/1	3.8-3.9	3.8/1	3.8/1	3.80
1934									3.7				
1935													
1936													

Compiled from reports of the Bureau of Agricultural Economics,
Division of Dairy & Poultry Products.

/1 Interpolated

Table 6. DUBUQUE, IOWA: Prices per hundredweight received by producers for all milk sold wholesale, in Iowa, Wisconsin, Illinois and the United States, 1910 - 1935.

Year	Iowa	Wisconsin	Illinois	United States
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
1910	1.48	1.26	1.51	1.74
1911	1.50	1.17	1.54	1.72
1912	1.55	1.33	1.49	1.82
1913	1.59	1.35	1.57	1.87
1914	1.66	1.33	1.58	1.85
1915	1.82	1.32	1.54	1.86
1916	2.00	1.59	1.67	1.90
1917	2.40	2.22	2.34	2.29
1918	3.00	2.68	2.88	2.78
1919	3.38	2.88	3.26	3.15
1920	3.37	2.61	3.13	3.43
1921	2.31	1.72	2.01	2.84
1922	2.02	1.68	1.79	2.53
1923	2.39	2.11	2.43	2.79
1924	2.16	1.79	2.31	2.50
1925	2.18	1.92	2.26	2.56
1926	2.27	1.95	2.34	2.51
1927	2.37	2.14	2.33	2.53
1928	2.39	2.16	2.34	2.56
1929	2.38	2.05	2.37	2.56
1930	2.05	1.64	2.19	2.30
1931	1.61	1.17	1.79	1.77
1932	1.20	.90	1.33	1.32
1933	1.11	.96	1.24	1.30
1934	1.29	1.10	1.43	1.52
1935	1.65	1.34	1.53	1.71

Compiled from reports of the Bureau of Agricultural Economics,
Division of Crop and Livestock Estimates.

Table 7. Dubuque, Iowa: Prices received by farmers for butterfat per pound in Iowa, Wisconsin, Illinois, and the United States.

Year	Iowa	Wisconsin	Illinois	United States
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
1921	35.3	42.7	36.0	38.4
1922	33.4	39.7	33.3	36.6
1923	42.2	47.6	41.8	43.2
1924	39.6	44.0	39.0	40.5
1925	41.8	46.7	40.3	42.3
1926	41.5	46.3	40.2	41.9
1927	45.5	50.8	43.1	44.4
1928	47.7	51.8	44.7	46.0
1929	46.7	49.3	43.7	45.1
1930	36.2	49.0	33.3	35.0
1931	26.5	39.2	24.2	25.4
1932	19.3	21.8	17.3	18.1
1933	20.1	22.8	18.0	18.8
1934	24.3	26.4	22.2	23.0
1935	29.9	31.9	27.5	28.5

Compiled from reports of the Bureau of Agricultural Economics,
Division of Crop and Livestock Estimates.

Table 8. Index of prices paid by farmers for commodities bought.

(1910 - 1914 = 100)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Pct.
1910													98
1911													101
1912													100
1913													101
1914													100
1915													105
1916													124
1917													149
1918													176
1919													202
1920													201
1921													152
1922													149
1923	151	151	152	152	153	153	152	152	151	151	150	150	152
1924	155	157	152	151	151	150	151	151	152	153	153	154	152
1925	155	156	158	158	158	158	157	156	155	155	155	155	157
1926	153	153	156	156	156	156	156	155	155	155	154	154	155
1927	153	153	152	153	153	154	154	153	153	153	152	152	153
1928	154	155	154	155	155	156	156	155	155	155	154	154	155
1929	151	151	155	154	154	153	153	154	154	153	153	152	153
1930	136	134	150	149	149	148	147	145	144	142	140	138	145
1931	115	114	132	130	129	127	125	123	121	120	118	117	124
1932	102	101	112	111	109	108	107	107	106	105	104	103	107
1933	117	109	100	101	102	103	107	112	116	116	116	116	109
1934	126	127	120	120	121	121	122	125	126	126	126	126	123
1935	122	122	127	127	127	127	126	125	123	123	122	122	125
1936			121	121	121	127	126	125	123	123	122	122	

/1 Preliminary.

Compiled from reports of the Division of Statistical and Historical Research, and Division of Crop and Live-stock Estimates, Bureau of Agricultural Economics.